CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

1.1 Overview and Background

On April 14, 2003, three Multiple Use Decisions (MUDs) made by the Bureau of Land Management (BLM) Elko Field Office (EFO) for the Sheep Allotment Complex, Big Springs and Owyhee allotments[1] were challenged in the United States District Court for the District of Nevada under the requirements of the Federal Lands Policy and Management Act (FLPMA), of 1976, and its implementing regulations including the Fundamentals of Rangeland Health (FRH), and National Environmental Policy Act (NEPA), of 1969 Specifically, the legal action against the BLM sought declaratory and injunctive relief for the management of livestock grazing on the identified lands and a "halt to ecological degradation which grazing and livestock is causing upon those public lands."

On August 18, 2004, the U.S. Department of the Interior, Bureau of Land Management (BLM) was directed to complete an Environmental Impact Statement (EIS) with respect to sensitive avian species for three MUD s issued by the BLM's Elko Field Office. Per Minute Order by The Honorable Judge Howard D. McKibben, U.S. District Court, District of Nevada, CV-N-013-197-HDM (VFC), the EIS is intended to determine impacts of livestock grazing (including both sheep and cattle) with respect to the following sensitive birds:

- Sheep Allotment Complex: sage grouse and raptors, including Western burrowing owl;
- Owyhee Allotment: sage grouse and raptors, including Western burrowing owls; and
- Big Springs Allotment: sage-grouse.

As ordered, "*To the extent applicable to these sensitive species the BLM shall evaluate the impacts of grazing, considering springs, seeps and riparian areas, uplands habitat and land use plans*."

When Judge McKibben ordered that this Sensitive Species Environmental Impact Statement (EIS) be prepared, he did not also vacate the MUDs.

The Nevada Department of Wildlife is a cooperating agency for the development of the EIS.

1.2 Purpose and Need

The purpose of the proposed action is to manage livestock grazing in the subject allotments to maintain and enhance productivity for all rangeland values, including habitat of the sensitive bird species. The need for action is to adjust grazing management to make significant progress toward meeting the *Standards and Guidelines for Rangeland Health* for the Northeastern Great Basin Resource Advisory Council area and achieve the multiple use objectives established by the Elko or Wells Resource Management Plan (RMP), and Rangeland Program Summary (RPS). Through monitoring, livestock grazing in the subject allotments has been determined to be a causal factor in not making significant progress towards meeting some rangeland health standards. Therefore, changes in grazing management are required in order to meet these standards and achieve the multiple use objectives.

1.3 Relationship to BLM Policies and Plans

1.3.1 Land Use Plan Conformance

In his order to prepare this EIS, the Judge required that, "*To the extent applicable to these sensitive species the BLM shall evaluate the impacts of grazing, considering ... land use plans."*

[1] All maps are included in Appendix A.

The proposed actions for the Sheep Allotment Complex and Big Springs Allotment conform to the following decisions and objectives of the Wells RMP, as approved July 19, 1985:

1. Livestock Grazing (Wells RMP Record of Decision (ROD), page 17)

- Provide for livestock grazing consistent with other resource uses.

- Monitor and adjust grazing management systems and livestock numbers as required. Livestock use will continue to occur in all allotments …. Once sufficient monitoring information is obtained, livestock stocking rates may be adjusted according to what the range will support.

2. Terrestrial Wildlife Habitat (Wells RMP ROD, pages 19-22)

- Conserve and/or enhance wildlife habitat to the maximum extent possible while eliminating all of the fencing hazards in crucial big game habitat, most of the fencing hazards in non-crucial big game habitat and all of the high and medium priority terrestrial riparian habitat conflicts in coordination with other resource uses.

- Continue to monitor the interaction between wildlife habitat condition and other resource uses and consider adjustments in livestock seasons of use to improve or maintain essential and crucial wildlife habitats.

- Designate and manage 6,200 acres as the Salt Lake ACEC to protect and enhance peregrine falcon habitat.

- Protect, enhance and/or develop 250 spring sources for their wildlife values.

- Active raptor nests adjacent to areas proposed for vegetation manipulation will be protected. On-the-ground work will be confined to the period preceding nesting activity or after the young have fledged (left the nest). Areas containing suitable nesting habitat will be inventoried for active raptor nests prior to initiation of any project.

- Alteration of sagebrush areas either through application of herbicides, prescribed burning, or by mechanical means will be in accordance with procedures specified in the Western States' Sage-Grouse Guidelines, the Memorandum of Understanding between the Nevada Department of Wildlife and Bureau of Land Management, as amended, and as future studies might dictate.

3. Riparian/Stream Habitat (Wells RMP ROD, pages 22-23)

- Improve high and medium priority riparian/stream habitat to at least good condition. Improve stream habitat … resulting in benefits … to other resources such as watershed, wildlife, livestock, erosion, flood control, water quality and recreation.

- Improve high and medium priority riparian/stream habitat to at least a good condition and prevent undue degradation of all riparian/stream habitat due to other uses.

- Manage areas in good or better habitat condition so that further declines in habitat quality do not occur.

For the Owyhee Allotment, the proposed actions conform to the Elko RMP, as approved March 11, 1987, including:

1. Livestock Management (Elko RMP ROD, page 20)

- Maintain or improve the conditions of the public rangelands to enhance productivity for all rangeland values.

- Implement a rangeland monitoring program to determine if management objectives are being met and adjust

grazing management systems and livestock numbers as required.

2. Wildlife (Elko RMP ROD, pp. 29 - 30)

- Conserve and enhance terrestrial, riparian and aquatic wildlife habitat.
- Monitor the interaction between wildlife habitat condition and other resource use and make adjustments in season of use for livestock to improve or maintain essential and crucial wildlife.

3. Threatened, Endangered and Sensitive Species (Elko RMP ROD, Standard Operating Procedure (SOP), p. 40)

- Actions in threatened, endangered, or candidate species' habitat will be designed to benefit these species through habitat improvement.... Other species considered sensitive, but not under protection of the [Endangered Species] Act, are given special management considerations through Bureau policy. If adverse impacts to these other sensitive species are identified during project planning, the project will be modified or possibly abandoned to avoid these impacts.
- Consistent with pertinent laws, regulations and policy, the approved land use plans for the Elko district require monitoring of the interaction between wildlife habitat condition and other resource use, and that adjustments be made in livestock grazing when necessary to improve or maintain habitat for fish and wildlife. All actions proposed as part of the MUDs are derived from evaluations of monitoring data for the grazing allotments. The Sheep Allotment Complex, Big Springs, and Owyhee Allotment Evaluations are incorporated by reference and are available for inspection upon request to the Elko Field Office.

1.3.2 Healthy Rangeland Standards and Guidelines, and Multiple Use Objectives

The Elko Field Office is within the Northeastern Great Basin Resource Advisory Council (RAC) area. The RAC developed *Standards and Guidelines for Rangeland Health* for the area, and these standards are guidelines provide direction for BLM management.

The rangeland health standards are:

1. Upland Sites: Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, and land form.
2. Riparian and Wetland Sites: Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.
3. Habitat: Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover, and living space for animal species and maintain ecological processes. Habitat conditions meet the life cycle requirements of threatened and endangered species.

For each allotment, multiple use objectives are established based on the resources and land uses suitable to the land within the allotment. This may include specific objectives for various wildlife species habitat, wild horses, vegetation, etc. The multiple use objectives for each of the allotments considered in this EIS are included in the allotment management plans (AMPs) specific to each allotment, and are incorporated herein by reference.

1.3.3 Western Association of Fish and Wildlife Agency Guidelines to Manage Sage-Grouse Populations and Their Habitats

In addition to the many other management objectives and/or standards that apply to sage-grouse and/or sagebrush habitats, both the Wells and Elko RMPs require that alterations of sagebrush areas would be in accordance with the 1977 *Western States Sage-Grouse Guidelines*, as amended, and as future studies might dictate. In 2000 the Western Association of Fish and Wildlife Agencies (WAFWA) finalized an update of the 1977 guidelines. The BLM, U.S. Forest Service, and U.S. Fish and Wildlife Service signed a memorandum of agreement to consider these guidelines in their respective planning efforts, utilizing local expertise and quantitative data. In addition, the agencies are urged to "use an adaptive management approach, using monitoring and evaluation to assess the success of implementing these guidelines to manage sage-grouse populations". In accordance with the existing land use plans and the 2000 Memorandum of Agreement, the BLM considers the WAFWA guidelines in all sage-grouse and/or sagebrush habitat enhancement projects that occur on public lands and/or are federally funded. These guidelines are not viewed as "hard and fast" standards in lieu of working collaboratively to improve range health. The BLM recognize that these guidelines need to be adapted to local environments and based on scientifically credible ecological data collected and analyzed at the local level.

1.3.4 Guidance for Sage-Grouse and Sagebrush Ecosystems

In Nevada, the BLM has recognized that generally lower moisture regimes prevail throughout the majority of Nevada's sagebrush ecosystem. Therefore, BLM developed a set of sage-grouse management guidelines designed to be consistent with the WAFWA guidelines, yet adapted to Nevada to provide interim guidance to BLM field managers without restricting options currently being explored for local sage-grouse conservation planning. The Nevada BLM Guidelines apply the most current sage-grouse science to BLM activities, within the context of a multiple use mandate. Because they were developed to be consistent with the WAFWA guidelines and more specific to Nevada, the Elko Field Office would continue to consider the Nevada guidelines, together with the WAFWA guidelines, in all sage-grouse and/or sagebrush habitat enhancement projects that occur on public lands and/or are federally funded. Nevada BLM Guidelines specific to Fire Management, Emergency Fire Rehabilitation, and Vegetation Treatments have been incorporated into the *Elko/Wells RMP Fire Amendment* as standard operating procedures.

1.4 Relationship to Other Laws, Policies, and Plans

1.4.1 Migratory Birds

The International Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703 *et seq.*) (MBTA) protects all migratory birds, including most raptors. With respect to the MBTA, Executive Order 13186 directs the federal agencies taking actions that have, or are likely to have, a measurable negative effect on migratory bird populations, to develop and implement a Memorandum of Understanding with the Fish and Wildlife Service that shall promote the conservation of migratory bird populations. The executive order further directs the agencies to integrate bird conservation principles, measures, and practices into agency activities, plans, and planning processes; restore and enhance the habitat of migratory birds, as practicable; and prevent or abate the pollution or detrimental alteration of the environment for the benefit of migratory birds, as practicable.

1.4.2 Bald Eagle Protection Act

The Bald Eagle Protection Act (PL 92-535), through provisions and amendments, provides federal protection to the golden eagle. This act prohibits the direct or indirect taking of an eagle, eagle part or product, or eagle nest.

1.4.3 State Plans

1.4.3.1 Nevada and Eastern California Sage-Grouse Conservation Plan

A State Sage-Grouse Conservation Team (State Team) was convened by the Governor of Nevada in August 2000 with the purpose of developing a strategy for conserving sage-grouse in Nevada and providing an example for other states to follow. The State Team developed a strategy that included seven local working groups within Nevada and eastern California. The local working groups developed local sage-grouse conservation plans that were combined into one comprehensive plan for Nevada and eastern California (State Plan).

The State Plan basically outlines procedures for maintaining existing sage-grouse habitats, identification of degraded habitats in need of restoration and/or rehabilitation, and projects to enhance key habitats. The proposed actions for the Sheep Allotment Complex, Owyhee, and Big Springs allotments are consistent with the State Plan.

1.4.3.2 Nevada Bird Conservation Plan

The State of Nevada developed a statewide plan for bird conservation in 1999 which provides conservation principles for managing avian habitats, including raptor species.

1.4.3.3 Nevada Comprehensive Wildlife Strategy

The State of Nevada, in partnership with several conservation organizations, developed the State of Nevada Comprehensive Wildlife Conservation Strategy in 2005. This strategy was necessary to make Nevada eligible for federal funding under the State Wildlife Grants Program, and the Conservation and Reinvestment Act, if passed by Congress. The overriding goal of this strategy is "to maintain healthy, self-sustaining populations of Nevada's Species of Conservation Priority and their habitats."

1.5 Significant Issues Addressed in this EIS

In making his ruling and issuing the Minute Order, the Honorable Judge McKibben indicated that the NEPA analysis completed for the MUD was adequate for all resources except for the sensitive bird species identified in the Minute Order. Many of the 148 comments/issues received from the public were determined to be beyond the scope of this EIS, as defined by the Minute Order.

Based on this ruling and the Minute Order, and the public scoping and tribal consultation process, the issues to be carried forward for analysis are identified in **Table 1-1**. The EIS addresses the effects of grazing action from the MUD s, and alternatives, including proposed range improvements, to determine potential impacts on sage-grouse and the other sensitive raptors. The remaining issues were beyond the scope of the Minute Order and are not considered in the EIS.

1.6 Organization of this Environmental Impact Statement

This EIS follows the Council of Environmental Quality (CEQ) recommended organization (40 CFR § 1502.10). Chapter 1.0 provides an overview and background, purpose and need statement, applicable regulatory requirements, and significant issues to be addressed. Chapter 2.0 describes the alternatives in detail. Chapter 3.0 provides a description of the affected environments and environmental consequences of implementing the alternatives, as well as provides a description of the mitigation measures recommended to reduce or eliminate impacts, identifies residual impacts, and identifies cumulative effects for each resource. Chapter 3.0 is organized by allotment in an effort to consolidate the discussion of affected environment and environmental consequences of each alternative for a given allotment. Chapter 4.0 details the public participation and coordination conducted for the EIS process. Chapters 5.0 and 6.0 provide a list of preparers and the references used in preparation of the EIS, respectively. Chapter 7.0 consists of the glossary of terms used in the EIS and a list of acronyms used in the EIS. Applicable appendices are appended to the end of the EIS.

Table 1 - 1: Elko Avian Sensitive Species EIS - Public Scoping Issues to be Addressed in the EIS

Public Scoping Comment	Issue
No adverse impacts to raptor habitat from grazing.	Grazing may affect the various resources which constitute the habitat for raptors and their prey.
Do not believe that their grazing has harmed habitat for raptors.	
Sheep Creek Allotment evaluation - Nesting and wintering habitat for raptors.	
Burrowing owl declining populations.	
Evaluation needs to address the habitat needs of raptors with respect to grazing.	
Raptor migration through Goshute Mountains.	
Concern for wild horse numbers and impacts.	Wild horse grazing may affect the various resources which constitute the habitat for raptors and their prey, and for sage-grouse.
What are current avian species and their populations in the allotments?	Adequacy of the quantity and type of data used in the evaluation and available for EIS analysis.
What avian habitat components occur in the allotments?	
What are the habitat conditions?	
Lack of use pattern mapping data.	
What impacts has past grazing had on habitat conditions?	Analyze past, present, and reasonably foreseeable future actions.
Most avian species included in the EIS depend on sagebrush communities, except burrowing owl, which uses disturbed areas.	Inclusion of avian species and determination of available habitat type areas consistent with the Judge's order.
Antelope and elk populations expected to increase with water development implementation.	Impacts to other wildlife species were previously analyzed and are beyond the scope of this EIS.
NDOW still desires to reintroduce bighorn sheep in the Goshutes.	Bighorn sheep introduction as a reasonably foreseeable future action if domestic sheep are either removed from the allotments or limited to the lower elevation areas.
Proposed action would result in potential for increased stocking rates; can Land Use Plan (LUP), RPS, and allotment goals be met?	Determination of appropriate stocking rates through the evaluation of Alternatives.
Proposed action would result in potential for increased stocking rates; can LUP, RPS, and allotment goals be met?	
State sage-grouse conservation efforts should be included in the EIS analysis.	Analysis of grazing and range improvements should include consideration of sage-grouse conservation efforts.

Public Scoping Comment	Issue
Altered fire cycles.	Grazing may affect fire ecology as related to changes in fuel and fire cycles.
How will proposed grazing systems and range improvements impact avian species and habitats?	Grazing and range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage-grouse.
Non-game wildlife was not adequately covered in the Sheep Allotment Complex Evaluation	
Non-game wildlife was not adequately covered in the Big Springs Allotment Evaluation.	
Oppose crestline fence on the Pequops due to big game movements.	
Will range improvements be cost-effective?	
Issues in Squaw Creek watershed - non-functioning troughs, diversions to the creek, lack of maintenance of range improvements.	
Weeds in areas of livestock concentration.	
Over utilization of bitterbrush in Squaw Creek.	
More range improvements will lead to more roads and more habitat fragmentation for sage-grouse.	
Sagebrush biome - has been degraded across the west.	
Sagebrush bird species summaries - Livestock impacts to birds need to be considered.	
Conservation strategies - issues - cheatgrass, altered fire regimes, invasive species microbiotic crusts.	
Threats to habitats to be addressed - list of threats.	
Altered composition and structure/lost productivity.	
Predator-prey relationships.	
Herbaceous cover for sage-grouse and other special status species.	
Road rehab/restoration.	
Sheep Allotment Complex - water developments - condition, impacts, etc.	
Noxious weeds.	
Fourmile Butte well, pipeline and fence - concern that this project is going forward without the EIS being completed first. All issues raised in this letter have been previously raised in all of the other letters.	
Condition of springs indicated as wild horse issue, but livestock have also damaged springs.	Grazing and range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage-grouse, including springs and riparian areas.
Improvement of riparian areas at springs is necessary.	
Full inventory and assessment of all springs, seeps, and wet meadows and study the role of historic and ongoing livestock impacts and other impacts (roads, mining, wild horses, etc.).	
Restoration actions for damaged or degraded riparian areas must be assessed under all alternatives.	

Public Scoping Comment	Issue
Intermittent/perennial drainages - livestock impacts - water quality, channel morphology, riparian vegetation, trampling.	
Desertification and watersheds - has this occurred and to what levels?	
Sagebrush and other habitat assessments - must consider all habitats on regional basis	Determination of the analysis area and methods to encompass all indirect impacts as necessary.
Sage-grouse.	Determination of effects of grazing and range improvements on the various resources which constitute the habitat for sage-grouse.
BLM past management has failed to protect these water/habitat sources.	Determination of cumulative effects on water/habitat sources.
Concern for lack of woody vegetation along S.F. Owyhee River	Grazing and range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage-grouse, including riparian areas.
Suggestion for Wildlife Objective Technical Recommendation for Riparian Pasture.	
Recommend inclusion of other avian species in the EIS; all BLM sensitive species.	Grazing and range improvements may affect other sensitive species in addition to raptors and sage-grouse.
Fences are barriers and hazards to sage-grouse and other wildlife.	Range improvements may affect the various resources which constitute the habitat for raptors and their prey, and sage-grouse.
Range improvements - habitat degradation and fragmentation.	
Livestock range installations and vegetation treatments.	
Water hauling.	
Sagebrush mammal summaries - Livestock impacts to mammals, as prey species, need to be considered.	Grazing and range improvements may affect prey species.
Grazing suitability and capability analysis - BLM must re-evaluate old forage adjudication studies; must evaluate suitability of grazing on public lands.	Use of best information available on carrying (grazing) capacity.
Livestock grazing suitability analysis.	
Data collection for alternatives and analysis.	Use of current data and literature.
Regional analysis of special status species, landscapes/ecosystems, watersheds and aquifers for EIS.	Use of the most current data and science to evaluate the impacts of the Proposed Action and alternatives.
Die-off and drought.	Drought and die-off may interact with grazing management to produce cumulative effects.

2.0 DESCRIPTION OF ALTERNATIVES

2.1 Introduction

The alternatives include the No Action Alternative (Alternative 1), which involves continuing the grazing systems that were in place prior to the allotment evaluation process (i.e., No Action) and implementation of the MUDs (Alternative 2), which involves modifying the grazing system as per the MUDs. In addition, the scoping process identified issues and potential alternatives for analysis that resulted in the development of two additional alternatives for the EIS. Grazing without riparian exclosures and vegetation treatments (Alternative 3) was developed in response to the concern regarding potential impacts of range improvements. Alternative 4 was developed in response to concern over the number of livestock and consists of reduced grazing in key sensitive species habitats where standards and guidelines are not being met and/or significant progress is not being made, and livestock are determined to be the causal factor.

Each of the alternatives is described below for each of the subject allotments.

2.2 Actions Common to All Alternatives

2.2.1 Resource Protection Measures

The following management actions are included as part of all alternatives:

1. Administer all grazing and any developments or projects within WSAs in full compliance with the *Interim Management Policy for Lands Under Wilderness Review*.

2. Wild horse appropriate management levels (AML) were established in the MUD for each Herd Management Area (HMA) by allotment and this applies to all alternatives.

3. As budget and scheduling allows remove sufficient numbers of wild horses associated with the HMAs to attain the AML and maintain wild horse populations at a level which would maintain a thriving natural ecological balance consistent with other resource values.

4. Continue to remove all wild horses that occupy areas managed as horse-free areas.

5. Treat invasive and noxious weeds in a manner that is most appropriate to the weed species and degree of infestation. Treatment would be in accordance with the procedures outlined by *the Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands* (BLM 1999; BLM/EK/PL-98/008.

6. Manage sage-grouse habitat (i.e. leks, nesting, brooding, and summer and winter habitats) consistent with the *Western States Sage Grouse Guidelines*, as adapted for use in Nevada.

7. As range improvement projects are designed, incorporate conservation measures from the 1999 *Nevada Bird Conservation Plan* and 2005 *Nevada Comprehensive Wildlife Strategy* that are recommended by NDOW when practical.

8. Remove or retire non-functioning and/or unnecessary range improvements, and repair, redesign, or rehabilitate spring developments to improve conditions, as time and funding allow.

9. Annual grazing authorizations would be adjusted in response to drought, fire, or other natural disturbances.

10. Allotment-specific objectives and monitoring are the same for all alternatives.

The following terms and conditions would be included in all grazing permits:

1. Authorized grazing use would be in accordance with the Assistant Field Manager's *Final Multiple Use Decision*.

2. Payment of grazing fees would be made prior to livestock turnout.

3. The terms and conditions of grazing permits may be modified if additional information indicates that revision is necessary to conform with 43 CFR §4180.

4. Supplemental feeding would be limited to salt, mineral, and/or protein supplements in block, granular or liquid form. Such supplements would be placed at least one quarter mile from live waters (springs, streams, and troughs), wet or dry meadows, and aspen stands.

5. An actual use report (Form 4130-5) showing use by use area within the allotment would be turned in within 15 days after completing annual use.

6. All range improvements would be maintained/repaired by the permittee prior to livestock turn out and throughout the grazing season in accordance with range improvement authorization permits.

7. All riparian exclosures, including spring development exclosures, would be closed to livestock use unless specifically authorized in writing by the Assistant Field Manager for Renewable Resources.

8. The numbers of livestock to be grazed would remain flexible according to the needs of the permittee. The grazing system is based on the number of animal unit months[2] (AUMs) that may be removed from each pasture/use area. Livestock numbers and periods of use would be applied for on an annual basis. Deviations beyond the flexibility described above may be allowed to meet the needs of the resources and the permittee as long as these deviations are consistent with multiple use objectives. Deviations beyond the limits of the flexibility outlined above, including deviations in the turnout date, increases in livestock numbers, and deviation from the grazing system, would require an application, and written authorization from the Assistant Field Manager for Renewable Resources prior to grazing use.

These terms and conditions would implement Guidelines 1.1, 2.1, 2.4, 3.1, 3.2, and 3.3, which have been developed by the Northeastern Great Basin Resource Advisory Council of Nevada to establish significant progress towards conformance with the *Standards for Rangeland Health for Upland Sites, Riparian and Wetland Sites, and Habitat*.

2.2.2 Monitoring

The BLM would continue to conduct necessary monitoring studies and periodically evaluate the effects of grazing to determine if progress is being made in meeting the standards for rangeland health and multiple use objectives for each allotment. The allotments would be re-evaluated in accordance with priorities established in the Elko Field Office Monitoring and Evaluation Schedule. If monitoring studies indicate a need to bring grazing use in line with capacity, necessary adjustments would be made. Studies would be conducted in conformance with BLM policy manual guidance and associated handbooks and technical references, or the *Nevada Rangeland Monitoring Handbook*.

[2] An animal unit month is the amount of forage necessary for the sustenance of one cow or its equivalent (e.g., five sheep) for a period of one month.

2.3 Sheep Allotment Complex Alternatives

The Sheep Allotment Complex encompasses 454,066 acres of public lands in Elko County, Nevada (**Map 2-1, Appendix A**). Prior to the MUD, the complex consisted of eight allotments (**Table 2-1**) but two allotments were administratively created from UT/NV #1 Allotment through the 2001 Final MUD, creating nine total allotments. The allotments are used as fall, winter, and early spring pastures for sheep.

Table 2 - 1: Sheep Allotment Complex - General Information for Individual Allotments

Allotment Name and Number	Acres of Public Land
	Total Acres
Leppy Hills (4322)	65,551
UT/NV #1 (4327)	116,594
Lead Hills (4321)	80,603
White Horse (4353)	61,571
West White Horse (4352)	7,208
Boone Springs (4307)	78,936
Sugarloaf (4147)	23,170
Ferber Flat (4314)	20,433
Total	454,066

2.3.1 Alternative 1 – Re-issue Grazing Permits at Historic Levels

Under this alternative, BLM would continue to implement the existing grazing management strategies with the existing range improvements (**Map 2-2, Appendix A**). However, the allotment evaluation analysis determined that the No Action Alternative was not achieving some of the Rangeland Health Standards or making significant progress toward some of the allotment objectives. Therefore, the No Action Alternative is not considered a viable alternative for selection, but does provide the baseline condition to which the EIS action alternatives may be compared. The No Action Alternative grazing systems for the Sheep Allotment Complex are described below.

The existing stocking levels and use by allotment and period of use for the Sheep Allotment Complex are detailed in **Table 2-2.** Total authorized use by livestock kind is 39,000 AUMs for sheep. The period of use is primarily winter, with early spring use in most of the allotments. During the period analyzed in the MUD, 1985 to 1999, the average actual use was 17,573 AUMs. This was 21,427 less AUMs than was permitted.

2.3.2 Alternative 2 – Implement the Multiple Use Decision

The following is a summary of the MUD for the Sheep Allotment Complex. Detailed descriptions, discussions, and rationales for these decisions are included in the *Final Multiple Use Decision for the Sheep Allotment Complex* (BLM 2001), which is incorporated herein by reference.

The allotments would be divided into Use Areas, which are equivalent to pastures except fences are not used to define the Use Areas (**Map 2-2, Appendix A**). Because sheep are herded, the herder is responsible for maintaining the sheep in the designated Use Area for the designated grazing period.

2.3.2.1 Grazing Management Decision

The actions proposed for the Sheep Allotment Complex include:

1. Establish a separate allotment for each permittee in the UT/NV #1 Allotment; split the allotment into the UT/NV North and UT/NV South Allotments.
2. Establish the total number of Animal Unit Months (AUMs) of permitted use for livestock the Sheep Allotment Complex as indicated in **Table 2-3**. The AML of wild horses for the Antelope Valley HMA is 144 to 259 and for the Goshute HMA is 74 to 123 wild horses. The AUMs allocated per allotment for wild horse is also indicated in **Table 2-3**.
3. Implement management systems and/or establish the season of use for each allotment in the Sheep Allotment

Complex as indicated below and in **Table 2-4**.

Table 2 - 2: Sheep Allotment Complex - Authorized Use, Historic Suspended Use (HSU), Voluntary Non-Use (VNU) and Period of Use

Allotment and Permittee	Authorized Use (AUMs)	HSU	VNU	Period of Use	Average Actual Use (AUMS)
Leppy Hills H & R Livestock	3,807[1]	867	0	11/16 to 4/30	2,257
UT/NV #1 Robert and Jon Child (North Pasture)	3,410[2]	643	976	11/10 to 4/30	2,115
Sherie R. Goring (South Pasture)	6,599	3,249	0	11/10 to 5/10	1,690
Lead Hills Jeffrey Roche	7,930	0	0	11/15 to 4/15	3,314
White Horse L.W. Peterson, Inc.	7,500	0	0	11/15 to 4/15	2,154
West White Horse Sherie R. Goring	670	330	0	11/15 to 3/31	564
Boone Springs Dave Morris	3,244	0	0	11/15 to 3/31	2,002
Sugarloaf Charles and John Young	3,105	0	0	11/15 to 4/20	1,979
Ferber Flat Bingham Family	2,735	0	0	11/20 to 4/20	1,498
TOTAL	39,000	5,089	976		17,573

[1] On January 28, 2000, the Elko Field office issued a decision closing a portion of the Leppy Hills Allotment that burned in the 1999 Pilot Fire. This resulted in 260 AUMs placed in suspension during the closure.

[2] On June 15, 1999 the Elko Field Office issued a decision canceling 61 AUMs in the North Pasture of the UT/NV #1 Allotment. The AUMs were cancelled as a result of the Big Springs Ranch (BSR) Land Exchange.

Table 2 - 3: Alternative 2 – Sheep Allotment Complex Multiple Use Decision Summary

Livestock AUMs and Wild Horse AML, and Total AUMs					
Allotment	**Pre-Evaluation Carrying Capacity**		**Post-Evaluation Desired Carrying Capacity (CC)**		**Total Post-Evaluation CC**
	Livestock permitted use (AUMs)	**Wild Horse Initial Stocking Level (AUMs)[1]**	**Livestock permitted use**	**Wild Horse AML (AUMs)**	**Total Post-Eval. Carrying Capacity (AUMs)**
Leppy Hills	3,807	320	3,351	96	3,447
UT/NV North	4,386	363	3,704	108	3,812
UT/NV South	6,599	107	2,646	87[2]	2,733
Lead Hills	7,930	43	5,609	12	5,621
White Horse	7,500	incidental use	3,916	incidental use	3,916
West White Horse	670	incidental use	465	incidental use	465
Sugarloaf	3,105	incidental use	2,001	incidental use	2,001
Ferber Flat	2,735	incidental use	2,013	incidental use	2,013
Boone Springs	3,244	897	2,947	265[3]	3,212
Total	39,976	1,730	26,652	568	27,220

[1] As per the Wells RMP Wild Horse Amendment.
[2] Average actual use.
[3] Ten percent use prior to livestock turnout was used to estimate AML/AUMs
* Sheep trail AUMs incorporated.

Table 2 - 4: Alternative 2 – Period of Use for Allotments in the Sheep Allotment Complex

Allotment	Period of Use	Livestock Numbers	AUMs
Leppy Hills	11/01 to 2/28; 3/01 to 4/30	2,816 2,816	3,351
UT/NV North	11/01 to 2/28 3/01 to 4/30	3,284 3,284	3,704
UT/NV South	11/15 to 2/28 3.01 to 4/30	2,408 2,408	2,646
Lead Hills	11/01 to 2/28 3/01 to 4/15	5,649 5,649	5,609
White Horse	11/15 to 2/28 3/01 to 4/15	3,918 3,918	3,916
West White Horse	12/01 to 2/28 12/01 to 2/28 12/01 to 2/28	549 549 786	325 325 465
Sugarloaf	11/01 to 2/28 3/01 to 4/20	1,770 1,770	2,001
Ferber Flat	11/01 to 2/28 3/01 to 4/20	1,950 1,950	2,013
Boone Springs	11/01 to 2/28 3/01 to 3/31	2,968 2,968	2,947

Leppy Hills Allotment. The allotment would be divided into three use areas. Use Area A would be located from the Playa reservoirs south to the allotment boundary and west of BLM road #1050. Use would be authorized from April 1 to April 30. Use Area B would be located north and east of the Goshute Mountains and Use Area A. Use would be authorized from November 1 to March 31. Morris Basin Use Area would be located in the Goshute Mountains. Approximately 450 AUMs occur in this basin, and grazing would be authorized from November 1 to December 1 and from April 1 to April 30. Morris Basin and Use Area A would be used on a rest rotation schedule as indicated in **Table 2-5**.

Table 2 - 5: Leppy Hills Allotment Spring Use System

Year	Use Area
1	Morris Basin
2	A
3	Morris Basin
4	A
5	Repeat cycle

Utah/Nevada North Allotment. The allotment includes three use areas. Authorized use would be from November 1 to March 31 allotment-wide. The Oana corral is located in both Use Area A and B, and the permittee would be allowed to utilize the corrals each year for loading and handling. Morgan Basin Use Area would be authorized from November 1 to December 1 and from April 1 to April 30. a total of 976 AUMs are located in this use area. For the period April 1 to April 30 each year, the grazing system would rotate among the three use areas as indicated in **Table 2-6**.

Table 2 - 6: UT/NV North Allotment Grazing System for the Period April 1 to April 30

Year	Use Area
1	B
2	A
3	Morgan Basin
4	Repeat cycle

Utah/Nevada South Allotment. Fall and winter use, November 1 to March 31 would be authorized allotment-wide. Use during April 1 to April 30 would occur west of Ferber Flat Road. Sheep would also be allowed in and around the Ferber Corral during shearing and loading times.

Lead Hills Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide, except that no grazing would be allowed in the ACEC after March 1. Spring use, April 1 to April 15 each year, would be made among three use areas on a rest rotation basis as indicated in **Table 2-7**. Use Area A would include all land to the west of Alternate Highway 93 and south of the Felt Wash to the allotment boundary. Use Area B would include all of the land west of Alternate Highway 93 and north of Felt wash to the allotment boundary. Use Area C would include all of the land east of Alternate Highway 93 to the Ferguson Flat Road (BLM Road # 1118). No grazing would be allowed in the ACEC after March 1.

Table 2 - 7: Lead Hills Allotment Grazing Rotation for the Period April 1 to April 15

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

White Horse Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide. Use during April 1 to April 15 each year would be among three of the four use areas on a rest rotation basis as indicated in **Table 2-8**. Use Area A would include all land west of Alternate Highway 93 from the north boundary of the allotment south to White Horse Pass. Use Area B would include land from the West White Horse Allotment boundary north to one mile south of the Ibapah Road. Use Area C would include all land on the west side of the Goshute Mountains to the east of Antelope Valley on the upper foothills. Use Area D would include all of the land east of Alternate Highway 93 and north of the Ibapah Road to the Ferguson Flat Road (BLM Road # 1118), on its south and eastern boundary. Due to the close proximity of Use Area C to extensive white sage vegetation, this Use Area would be not be included in the rotation, except through written authorization.

Table 2 - 8: White Horse Allotment Grazing Rotation for the Period April 1 to April 15

Year	Use Area
1	A
2	B
3	D
4	Repeat cycle

West White Horse Allotment. Winter use, December 1 to February 28, would occur in two use areas, the Valley Use Area and the Bench Use Area. The Valley Use Area would be used in all years, and the Bench Use Area would be used only one out of every three years (**Table 2-9**). When the Bench Use Area is rested, 140 AUMs would be placed into non-use for conservation of the federal range. No sheep bedding would be allowed in the Bench Use Area of the allotment.

Table 2 - 9: West White Horse Allotment Winter Use Grazing

Year	Use Area
1	Valley
2	Valley
3	Valley and Bench
4	Repeat cycle

Sugarloaf Allotment. Fall and winter use, November 1 to March 31, would be authorized allotment-wide. Use during April 1 to April 20 would be among three use areas on a rest rotation basis as indicated in **Table 2-10**. Use Area A would include land to the west of the Ferber Flat Road (BLM Road # 1025). Use Area B would include all land from the northern extent of the Ferber Hills south to the allotment boundary. Use Area C would include land north of the Ferber Hills to the allotment boundary and west to the Ferber Flat Road.

Table 2 - 10: Sugarloaf Allotment Grazing Rotation for the Period April 1 to April 20

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Ferber Flat Allotment. Fall and winter use, November 1 to Mark 31, would be authorized allotment-wide. Use during April 1 to April 20 would be among three use areas on a rest rotation basis as indicated in **Table 2-11**. Use Area A would include land from Ferber Flat Road (BLM Road # 1025) west to the Upper Bench Road (BLM Road # 1026). Use Area B would include all

land east of the Ferber Flat Road. Use Area C would include land from the Upper Bench Road west to Little White Horse Pass and south to the allotment boundary.

Table 2 - 11: Ferber Flat Allotment Grazing Rotation for the Period April 1 to April 30

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Boone Springs Allotment. Two use areas have been identified for this allotment. Use Area A would include the land north and west of Alternate Highway 93, with a capacity of 947 AUMs. Use Area B would include lands south and east of Alternate Highway 93, with a capacity of 2,000 AUMs. When Use Area A is grazed, permitted use would be 947 AUMs and when Use Are B is grazed, permitted use would be 2,000 AUMs.

4. The livestock permittee is expected to move their livestock so as to not exceed established utilization objectives for fall and winter use. Annual utilization on the previous year's growth in the three use areas would not exceed 50 percent on the salt desert shrubs and other key shrubs (e.g., black sagebrush), and 50 percent on key herbaceous species. When either utilization objective is reached, livestock would be removed from the allotment within five days.

5. Annual utilization on current year's growth in spring use areas is not to exceed 30 percent on salt desert shrubs or other key shrub species and 50 percent (moderate) on key herbaceous species. If utilization is exceeded in two consecutive years, the scheduled off date would be adjusted to March 31.

6. Annual utilization on the previous year's growth in use areas is not to exceed 50 percent on salt desert shrubs or other key shrub species and 60 percent on key herbaceous species. When the utilization objective is reached on any key species, livestock would be removed from the use area within five days. If utilization is exceeded in all use areas, then livestock would be removed from the allotment within five days.

7. Vacate the UT/NV#1 Allotment Management Plan (AMP) approved on November 8, 1972.

8. Establish terms and conditions on each term grazing permit within the Sheep Allotment Complex that would read as follows:

   (a) No sheep camps would be located in WSAs or the ACEC.

   (b) No water hauling or placement of troughs would be allowed inside the boundaries of the Bluebell and Goshute Peak WSAs.

   (c) All hay for the use in and around sheep camps must be certified weed free prior to livestock turnout.

9. Construct the range improvement projects within the Sheep Allotment Complex as listed in **Table 2-12**, and shown in **Map 2-3, Appendix A.**

10. The permittee(s) would be assigned maintenance of existing spring developments and exclosures. Maintenance responsibility for the proposed Ferguson Spring Exclosure would be assigned to the NDOW. Maintenance responsibility for other future spring developments and exclosures would be assigned to the party(s) deriving the primary benefit(s).

11. Establish new key areas in the Sheep Allotment Complex.

Table 2 - 12: Proposed Range Improvements for the Sheep Allotment Complex

Project	Allotment	Units	Inside WSA
Rock Spring exclosure and trough	Leppy Hills	1	yes
Leppy Hills Well	Leppy Hills	1	no
Side Hill exclosure and trough	UT/NV North	1	yes
Morgan Basin Spring exclosure and trough	UT/NV North	1	yes
Spring Gulch Spring exclosure and trough	UT/NV North	1	no
Felt Spring exclosure and trough	Lead Hills	1	no
Ferguson Spring exclosure	Lead Hills	1	no
Perkins Spring exclosure and trough	Boone Springs	1	no

12. Continue to conduct necessary monitoring studies and periodically evaluate the effects of grazing to determine if progress is being made in meeting the multiple use objectives and standards for rangeland health. The Sheep Allotment Complex would be re-evaluated in accordance with priorities established in the Elko Field Office Monitoring and Evaluation Schedule. If monitoring studies indicate a need to bring grazing use in line with capacity, necessary adjustments would be made. Studies would be conducted in accordance with BLM policy manual guidance as outlined in the *Nevada Rangeland Monitoring Handbook*.

2.3.2.2 Other Management Actions

The MUD also included actions and decisions with respect to fire management, wildlife, and wild horses, which are summarized below.

1. Implement the Sheep Allotment Complex Fire Management Plan. This fire management plan was developed from the MUD following negotiations between the BLM and a party who had petitioned the Interior Board of Land Appeals (IBLA) to stop implementation of the MUD. IBLA accepted the BLM's request to delete the Fire Management Plan from the MUD with the understanding that proposed fire management actions would be dealt with separately. Therefore, the proposed actions in the Sheep Allotment Complex Fire Management Plan would not be analyzed in this EIS.

2. Construct wildlife water catchment projects within the Sheep Allotment Complex as outlined in EA BLM/EK/PL-97/018.

3. Establish and maintain an AML for wild horses within the Sheep Allotment Complex.

4. Inventory, identify, and eliminate existing wire hazards. Clean up and dispose of old wire, especially where it creates a significant hazard to wild horses.

5. Continue to collect combined use utilization data and collect wild horse use only utilization data.

6. Continue to collect seasonal wild horse distribution data on the Antelope Valley and Goshute HMAs.

2.3.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the seven spring exclosures and associated troughs proposed in Alternative 2 would not be constructed (**Table 2-12**). The grazing system would be the same as proposed in Alternative 2.

2.3.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, sensitive species habitats have been identified where Rangeland Health Standards were not being met and/or significant progress was not being made, and livestock were determined to be the causal factor. The key sensitive species habitats addressed by this alternative include sage grouse nesting habitat and white sage or winterfat habitats that are important raptor prey species' habitat.

The grazing would be similar to Alternative 2, except all early spring grazing would be eliminated. Grazing would be restricted to the dormant season by ceasing all livestock grazing on March 31. This change would reduce the livestock grazing in the Sheep Allotment Complex by 1,573 AUMs from the levels proposed in Alternative 2. The total carrying capacity for livestock and wild horses would be 25,647 AUMs.

The actions proposed for the Sheep Allotment Complex under this alternative include:

1. Establish the total number of AUMs permitted use for livestock and appropriate management level (AML) for wild horses for the Sheep Allotment Complex as indicated in (**Table 2-13**) until rangeland health standards are met.

Table 2 - 13: Alternative 4 - Sheep Allotment Complex - Livestock AUMs, Wild Horse AML, and Total AUMs

Allotment	MUD Carrying Capacity		Alternative 4 - Desired Carrying Capacity (CC)		Total CC
	Livestock permitted use (AUMs)	Wild Horse AML (AUMs)	Livestock permitted use	Wild Horse AML (AUMs)	(Livestock and Wild Horses)
Leppy Hills	3,351	96	3,351	96	3,447
UT/NV North	3,704	108	3,704	108	3,812
UT/NV South	2,646	87	2,646	87	2,733
Lead Hills	5,609	12	5,138	12	5,150
White Horse	3,916	incidental use	3,335	incidental use	3,335
West White Horse	465	incidental use	398	incidental use	398
Sugarloaf	2,001	incidental use	1,791	incidental use	1,791
Ferber Flat	2,013	incidental use	1,769	incidental use	1,769
Boone Springs	2,947	265	2,947	265	3,212
Total	26,652	568	25,079	568	25,647

2. Implement management systems and/or establish the season of use for each allotment in the Sheep Allotment Complex as indicated below and in **Table 2-14** and **Map 2-4, Appendix A**.

Leppy Hills Allotment. The allotment would be divided into three use areas. Use Area A would be located from the Playa reservoirs south to the allotment boundary and west of BLM road

#1050. Use would be authorized from March 1 to March 31. Use Area B would be located north and east of the November 1 to February 28. Morris

Table 2 - 14: Alternative 4 - Period of Use for Allotments in the Sheep Allotment Complex

Allotment	Period of Use
Leppy Hills	11/01 to 2/28; 3/01 to 3/31
UT/NV North	11/01 to 2/28 3/01 to 3/31
UT/NV South	11/15 to 2/28 3/01 to 3/31
Lead Hills	11/01 to 2/28 3/01 to 3/31
White Horse	11/15 to 2/28 3/01 to 3/31
West White Horse	Year 1 -12/01 to 2/28 Year 2 -12/01 to 2/28 Year - 12/01 to 2/28
Sugarloaf	11/01 to 2/28 3/01 to 3/31
Ferber Flat	11/01 to 2/28 3/01 to 3/31
Boone Springs	11/01 to 2/28 3/01 to 3/31

Basin Use Area would be located in the Goshute Mountains. Approximately 450 AUMs occur in this basin, but grazing would be authorized on an annual review basis for this Use Area. When authorized, use would be authorized from November 1 to December 31 and from March 1 to March 31. Unless specifically authorized in writing, no grazing would be allowed in the Morris Basin Use Area.

Utah/Nevada North Allotment. The allotment includes three use areas. Authorized use would be from November 1 to February 28 for Use Areas A and B. The Oana corral is located in both use areas and the permittee would be allowed to utilize the corrals each year for loading and handling. For the period March 1 to March 31, the grazing system would rotate among the three use areas as indicated in **Table 2-15**. In addition, approximately 976 AUMs occur in Morgan Basin Use Area, but grazing would be authorized on a pre-use review basis for this use area. Unless specifically authorized in writing, no grazing would be allowed in the Morgan Basin Use Area.

Table 2 - 15: UT/NV North Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	Morgan Basin
4	Repeat cycle

Utah/Nevada South Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would occur west of Ferber Flat Road. Sheep would also be allowed in and around the Ferber Corral during shearing and loading times.

Lead Hills Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Late winter use, March 1 to March 31, would be made among three use areas on a rest rotation basis as indicated in **Table 2-16**. Use Area A would include all land to the west of Alternate Highway 93 and south of the Felt Wash to the allotment boundary. Use Area B would include all of the land west of Alternate Highway 93 and north of Felt wash to the allotment boundary. Use Area C would include all of the land east of Alternate Highway 93 to the Ferguson Flat Road (BLM Road # 1118). No grazing would be allowed in the ACEC after March 1.

Table 2 - 16: Lead Hills Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

White Horse Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would be among three use areas on a rest rotation basis as indicated in **Table 2-17**. Use Area A would include all land west of Alternate Highway 93 from the north boundary of the allotment south to White Horse Pass. Use Area B would include land from the West White Horse Allotment boundary north to one mile south of the Ibapah Road. Use Area C would include all land on the west side of the Goshute Mountains to the east of Antelope Valley on the upper foothills. Use Area D would include all of the land east of Alternate Highway 93 and north of the Ibapah Road to the Ferguson Flat Road (BLM Road # 1118), on its south and eastern boundary. Due to the close proximity of Use Area C to extensive white sage vegetation, this Use Area would be not be included in the rotation, except through written authorization.

Table 2 - 17: White Horse Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	D
4	Repeat cycle

West White Horse Allotment. Winter use, December 1 to February 28, would occur in two use areas, the Valley Use Area and the Bench Use Area. The Valley Use Area would be used in all years, and the Bench Use Area would be used only one out of every three years (**Table 2-18**). When the Bench Use Area is rested, 119 AUMs would be placed into non-use for conservation of the federal range. No sheep bedding would be allowed in the Bench Use Area of the allotment.

Table 2 - 18: West White Horse Allotment Winter Use Grazing

Year	Use Area
1	Valley (279 AUMs)
2	Valley (279 AUMs)
3	Valley and Bench (398 AUMs)
4	Repeat cycle

Sugarloaf Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would be among three use areas on a rest rotation basis as indicated in **Table 2-19**. Use Area A would include land to the west of the Ferber Flat Road (BLM Road # 1025). Use Area B would include all land from the northern extent of the Ferber Hills south to the allotment boundary. Use Area C would include land north of the Ferber Hills to the allotment boundary and west to the Ferber Flat Road.

Table 2 - 19: Sugarloaf Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Ferber Flat Allotment. Fall and winter use, November 1 to February 28, would be authorized allotment-wide. Use during March 1 to March 31 would be among three use areas on a rest rotation basis as indicated in **Table 2-20**. Use Area A would include land from Ferber Flat Road (BLM Road # 1025) west to the Upper Bench Road (BLM Road # 1026). Use Area B would include all land east of the Ferber Flat Road. Use Area C would include land from the Upper Bench Road west to Little White Horse Pass and south to the allotment boundary.

Table 2 - 20: Ferber Flat Allotment Grazing Rotation for the Period March 1 to March 31

Year	Use Area
1	A
2	B
3	C
4	Repeat cycle

Boone Springs Allotment. Two use areas have been identified for this allotment. Use Area A would include the land north and west of Alternate Highway 93, with a capacity of 947 AUMs. Use Area B would include lands south and east of Alternate Highway 93, with a capacity of 2,000 AUMs. Use Area B would be used during fall and winter, November 1 to February 28. Use Area A would be used from March 1 to March 31.

3. The livestock permittee is expected to move their livestock so as to not exceed established utilization objectives for fall and winter use. Annual utilization on the previous year's growth in the three use areas would not exceed 50 percent on the salt desert shrubs and other key shrubs (e.g., black sagebrush), and 50 percent on key herbaceous species. When either utilization objective is reached, livestock would be removed from the allotment within five days.
4. The permittee would submit a grazing application to the EFO prior to the start of grazing each year describing the intended use within each use area. Planned use would be reviewed in relation to permitted use.

2.4 Big Springs Allotment

The Big Spring Allotment contains 479,088 acres (76 percent) of public (24 percent) of private lands, administered by the BLM's Elko Field Office, and is located north and west of the Sheep Allotment Complex (**Map 2-1, Appendix A**). The allotment has been used as two grazing Use Areas in the past based on the Rangeline Agreement of September 5, 1990.

2.4.1 Alternative 1 – Re-issue Grazing Permits at Historic Levels

Under this alternative, BLM would continue to implement the existing grazing management strategies (**Map 2-5**). However, the allotment evaluation analysis determined that the No Action Alternative was not achieving some of the Rangeland Health Standards or making significant progress toward some of the allotment objectives. Therefore, the No Action Alternative is not considered a viable alternative for selection, but does provide the baseline condition to which the EIS action alternatives may be compared. The No Action Alternative grazing systems for the Big Springs Allotment are described below.

The Big Springs Allotment was operated as one unit prior to 1995, but thereafter the allotment was divided to create two separate grazing use areas (not allotments) for the two permittees. The total allotment grazing privilege is 21,983 AUMs, apportioned as 16,598 AUMs within the East Big Springs grazing area and 5,385 AUMs within the West Big Springs grazing area. The allotment was under a year-long grazing system (March 1 to February 28). Kind of livestock permitted within the allotment includes cow/calf pairs, dry cows, and yearlings.

Actual use during the period 1987 to 1999 for West Big Spring Allotment averaged 2,730 AUM, with a low of 458 AUMs and a high of 4,402 AUMS. For the East Big Springs Allotment the actual use ranged from 505 AUMs to 11,929 AUMS, with an average of 7,770 AUMs.

2.4.2 Alternative 2 - Implement the Multiple Use Decision

The following is a summary of the MUD for the Big Springs Allotment. Detailed descriptions, discussions, and rationales for these decisions are included in the *Final Multiple Use Decision for the Big Springs Allotment* (BLM 2002), which is incorporated herein by reference.

2.4.2.1 Grazing Management Decisions

The actions proposed for the Big Springs Allotment include:

1. Divide the Big Springs Allotment into two separate allotments called East and West Big Springs Allotments with the dividing line on the crest/watershed divide, or nearly so, of the Pequop Mountains. If fences are constructed to separate all or a portion of these two allotments, the dividing line created by the new fence(s) would be considered the actual allotment boundary (**Map 2-6, Appendix A**).
2. Establish the Total Number of AUMs of Permitted Use for Livestock within the Big Springs Allotment as indicated in **Table 2-21**.
3. Implement livestock grazing management systems within the West and East Big Springs Allotments as follows:

(a) West Big Springs Allotment

Deferred rotation grazing would be applied to all pastures. The final grazing system incorporates new water sources to expand grazing distribution and seedings to increase forage and habitat around the water sources (**Map 2-6, Appendix A**). The interim and final grazing plans are described below.

Table 2 - 21: Big Springs Allotment – Multiple Use Decision Summary

Livestock Permittee	Pre-Evaluation Permitted Use (AUMs)	Post-Evaluation Active Permitted Use (AUMs)	Post-Evaluation Suspended Use (AUMs)
West Big Springs Allotment	5,385 [1]	4,788 [1,3]	597 [3]
East Big Springs Allotment	12,887 (16,598) [1,2]	9,454 (12,175) [1,2,3]	3,433 (4,423) [2,3]

[1] Includes Fenced Federal Range (FFR) AUMs.

[2] All of the stocking rates were evaluated with actual use data reported prior to the change in AUMs prompted by the BSR Land Exchange and therefore do not reflect the increase in permitted use following the BSR Land Exchange. The numbers in parenthesis (-) show permitted use adjustments as a result of the BSR Land Exchange.

[3] The AUMs credited to owned and leased private lands intermingled with public lands would be reduced by the same percentage as public land permitted use.

Interim Grazing System

The interim grazing system would be implemented until all range improvements have been completed.

Independence Valley Pasture. Some use areas would be grazed in the spring/early summer and the remaining Use Areas would be grazed in late summer/fall/ winter/early spring. Generally, the areas

grazed in the spring/early summer in one year would be grazed in late summer/fall of the next year. The southeast part of Independence Valley associated with Boxcar Well and North Boxcar Well would normally be reserved for late fall/winter use annually. Use Areas are associated with water sources in this pasture; there are no fences that separate the use areas within the pasture. Planned grazing would be controlled by turning on and off stock water, which is provided by wells with the exception of the springs at the Warm Springs Ranch. Installation of a water pipeline and trough on private land and water hauling would be performed by the permittee to facilitate the grazing system. An example of the rotation is detailed in **Table 2-22**. The apparent "ten months on" and "15 months off" for this pasture schedule in **Table 2-22** does not reflect the distribution due to the Use Areas. None of the Use Areas would receive more than about three months use, followed by at least one year of rest.

Holborn Pasture. Between mid-May and early July, livestock would be moved from the Independence Valley Pasture into the Holborn Pasture north of Interstate 80. The deferred rotation plan includes two years of use beginning as early as mid-May followed by two years of use beginning in July. Movement into the pasture in July would coincide with seedripe or seed dissemination for most of the forage plants, resulting in deferment in those years. The amount of

Table 2 - 22: Example Grazing Rotation Plan for West Big Springs Allotment

Independence Valley Pasture		
USE AREAS	**YEAR 1**	**YEAR 2**
Boxcar Well	Late Fall/Winter (12/01 - 03/31)	Late Fall/Winter (12/01 - 03/31)
North Boxcar Well Miners Well Rattlesnake Well NE Water Haul Site Honor Camp Troughs	Spring/Early Summer (04/01 - 06/30)	Late Summer/Fall/Winter/Early Spring (09/01 - 03/31)
Section 12 Well Warm Springs Johnson Well NW Water Haul Site	Late Summer/Fall/Winter/Early Spring (09/01 - 03/31)	Spring/Early Summer (04/01 - 06/30)
The private field at the Warm Springs Ranch is often grazed in the late summer/fall offering an additional use area. This field is currently leased by the permittee.		
Holborn Pasture		
USE AREAS	**YEARS 1 and 2**	**YEARS 3 and 4**
Holborn Pasture	Early (05/15 – 9/30)	Late (07/01 – 09/30)
North Pequop Mountain Pasture		
USE AREAS	**YEARS 1 and 2**	**YEARS 3 and 4**
North	Late (08/01 – 09/30)	Early (05/15 – 09/30)
South	Early (05/15 – 09/30)	Late (08/01 – 09/30)

time livestock remain in the pasture is dependent on available water for adequate distribution. In dry years, livestock would be moved to the North Pequop Mountain pasture earlier than the planned turn out date.

North Pequop Mountain Pasture. The pasture would receive deferment from livestock grazing in two ways. Livestock use would be rotated between the north and south ends of this pasture and livestock would remain in the Holborn Pasture until some time in July in some years before moving into the North Pequop Mountain Pasture.

The deferred rotation plan calls for the cattle to begin their use at the south end for two consecutive years. This is the area associated with Ralph Spring, West Spring, Rocky Point Spring, Beacon Spring, and West Squaw Creek Well. The permittee would move livestock drifting into the north end back to the south end in a timely manner. Similarly, the permittee would be responsible for monitoring livestock drift to the east side of this pasture, where the adjoining permittee grazes, and moving his livestock back to the west side in a timely manner. An important measure of the interim grazing system would be to remove livestock that drift into the East Squaw Creek and Upper Beacon Spring areas until the proposed riparian management fences are constructed. On or around August 1 the livestock would be moved and kept in the northern use area.

During the third and fourth years, the livestock would begin their grazing on the north end for two consecutive years. This area is associated with the Independence Well, Pequop Spring, and Pequop Well. Livestock tend to drift to the south end; therefore, the permittee would move livestock drifting to the south end back to the north end in a timely manner. Beginning on or about August 1, the livestock would be allowed to drift to the south part of the pasture. The permittee would be responsible for controlling drift to the east side of this pasture, where the adjoining permittee grazes, and for moving livestock back to the west side in a timely manner.

Final Grazing Plan

The final grazing plan would continue the deferred rotation practices described above under the *Interim Grazing Plan.* The final grazing plan differs from the interim grazing plan only by the addition of the proposed permanent water locations and seedings in various locations along with the allotment boundary fence on a portion of the North Pequop Mountain Pasture (**Table 2-23** and **Map 2-6**).

The Independence Valley Well and Independence Valley Seeding are proposed for the Independence Valley Pasture. The well would be located between Interstate 80 and the existing Johnson Well. The seeding would be associated with existing and proposed water locations. The seed mix would include forage grasses, shrubs, semi-shrubs, and forbs. The areas to be seeded would be the lower bench and valley big sagebrush and rabbitbrush areas that lack adequate grasses and forbs. The acreage of seeding would not be one large block, but several small seedings, with locations to be determined by field inspections. In addition, the Hogan Spring/seep area on the west bench of the Pequop Mountains would be monitored to determine if a spring development and exclosure should be developed as protection of the water source from wild horses and/or livestock.

The Warm Springs Ranch Drift Fence would also be considered for this pasture

Table 2 - 23: Proposed Range Improvements for the West Big Springs Allotment

Project	Units
Independence Valley Well	1 ea
Independence Valley Seeding	4,000 ac
Holborn Seeding	1,000 ac
East and West Big Springs Boundary Fence	3 miles
North Pequop Mountain Well	1 ea
Pequop Mountain Bench Well	1 ea
Pequop Well Storage Tank	1 ea
Spring Developments/Exclosures (As determined by monitoring)	To be determined
Warm Springs Ranch Drift Fence	To be determined

to prevent livestock from drifting back to the Warm Springs Ranch area.

Within the Holborn Pasture, approximately 1,000 acres are proposed for seeding to restore productivity in the area of the Nevada Department of Transportation (NDOT) well. The seed mix would include forage grasses, shrubs, semi-shrubs, and forbs. The areas to be seeded would be in big sagebrush vegetation.

Within the North Pequop Mountain Pasture several water developments and allotment boundary fence are proposed. The water wells and developments would be located:

- on the north Pequop Mountain bench, approximately two miles west of Pequop Spring (North Pequop Mountain Well);
- on the north Pequop Mountain bench, approximately two miles east of Pequop Spring (Pequop Mountain Bench well)[3]; and
- at the Pequop Well (water storage tank and/or repair of the reservoir).

The boundary fence between the East and West Big Springs Allotments within the North Pequop Mountain Pasture is proposed for approximately three miles from Interstate 80 at Pequop Summit to Rocky Point, with a short gap fence in the canyon immediately north of Rocky Point. This fence is proposed as a let-down fence to be let down by September 30 and put up prior to entry of livestock the following year.

In addition, the existing and proposed water developments within this pasture would be evaluated to determine if modification is warranted to encourage riparian vegetation. The existing spring developments were developed by capturing all of the water from the spring source and conveying it to a trough at distance from the spring source, precluding the maintenance of riparian vegetation at or near the spring source.

(b) East Big Springs Allotment

Deferred rotation grazing would be applied to all pastures receiving grazing use during the critical growing season. Pastures receiving only fall or winter use would be deferred from grazing during the growing season every year. The final grazing system incorporates new water sources to expand grazing distribution, new seedings to increase forage and habitat around the water sources, additional fencing to protect riparian habitat, and new seedings to improve the management of livestock under the deferred rotation system (**Map 2-6**).

[3] This well would not be operated until July 1 to discourage livestock grazing of sage grouse nesting and brood rearing areas.

Interim Grazing Plan

The interim grazing system would be implemented until all range improvements have been completed.

Shafter Pasture. This pasture would be the primary area for winter/early spring use. Livestock would graze this pasture beginning in November, using the northern part of the pasture (Silver Zone Use Area) in November and then moved south to the use area associated with Shafter Well #1, Shafter Well, and Shafter Well #2 until mid-April. However, late winter/early spring use occurs on the west side of the Shafter Pasture when snowmelt and/or rains provide sufficient water for use in this area. The Shafter wells would be turned off and the livestock would be moved to the greasewood flats and sagebrush draws. The livestock would be moved out of this pasture in March to mid-April (**Table 2-24**).

East Pequop Bench Pasture. Fire rehabilitation actions following the Big Springs Fire of 2000 resulted in the installation of a fence on the south end of the fire and seeding in the burned area. The fence separates the northern part of the east Pequop bench from the remainder of the pasture. This North Use Area is closed to livestock grazing until the seeding establishment criteria have

Table 2 - 24: East Big Springs Allotment Interim Grazing System

PASTURE/USE AREA	YEARS 1 & 2	YEARS 3 & 4
Shafter	10/01 - 4/15	10/01 - 4/15
East Pequop Bench North Bench South Bench/Hardy Creek pipeline	03/01 - 06/30[1] Period of use within each use area to be defined on an annual basis.	03/01 - 06/30[1] Period of use within each use area to be defined on an annual basis.
Payne Basin/Six-Mile Canyon	05/16 - 09/30	07/01 - 09/30
East Squaw Creek	04/01 - 10/15 Period of use to be defined on an annual basis.	04/01 - 10/15 Period of use to be defined on an annual basis.
North Pequop Mountain East Beacon/Upper Squaw Creek Baker Spring	 05/01 - 07/31 07/01 - 09/30	 05/01 - 07/31 07/01 - 09/30
Windmill Seeding	07/01 - 10/31	07/01 - 10/31
Railroad Seeding	07/01 - 10/31	07/01 - 10/31
Squaw Creek Ranch	Up to 3 Weeks 05/01 - 07/31	Up to 3 Weeks 05/01 - 07/31
Lower Squaw Creek Ranch	Up to 3 Weeks 08/01 - 10/31	Up to 3 Weeks 08/01 - 10/31
Collar & Elbow	08/15 - 01/31	08/15 - 01/31
North of Home	Period of use to be defined on an annual basis.	Period of use to be defined on an annual basis.

[1] A fire rehabilitation seeding was completed for a portion of the North Bench use area in the Fall of 2000. This rehabilitation area is closed to livestock use for two growing seasons or until seeding establishment criteria have been met.

been met. Until the North Use Area is open, the South Bench/Hardy Creek Use Area and the Pipeline Use Area (east of Big Springs Ranch) would be available for livestock use.

Grazing in the use areas would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture. Deferred grazing use of each use area during the critical growing season two out of every four years is the goal. However, during the period of fire closure of the North Use Area, use in the South Bench, Hardy or Pipeline use areas would be planned so that utilization of key forage species would not exceed 40 percent use by the end of the critical growth period.

Payne Basin Pasture. This pasture would receive two years of use which includes critical growing season followed by two years of deferred use.

Six Mile Canyon Pasture. This pasture would receive two years of use which includes the critical growing season followed by two years of deferred use. In years of use during the critical growth period of key forage species (May 15 to July 15), utilization would be managed so as not to exceed 40 percent. In years of deferment (after July 15), utilization would be managed so as not to exceed 50 percent of the key forage species.

East Squaw Creek Pasture. The grazing of this pasture would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture. The South Seeding portion of this pasture would be grazed each year between April 1 and October 15. Grazing in the spring prior to the livestock being moved into the North Pequop Mountain Pasture, and grazing again in the late summer/fall as the livestock come off of the summer range would be the most common use of this pasture. Use during late summer/fall would depend on the level of use made in the spring and the amount of regrowth available for later use.

The native portion of this pasture would be grazed in conjunction with the seeding on the south end; however, use in the native area is expected to be light because most of the livestock tend to graze the South Seeding portion of this pasture. In the event that the level of grazing use on the native key forage grasses at the Key Area exceeds the light utilization category by the end of the growing season for two years in a row, or more than two out of four consecutive years, use on the native area would be deferred until July 1 for two out of four consecutive years.

North Pequop Mountain Pasture. This pasture is the primary summer range for the livestock operation. The portion of this pasture associated with Upper East Squaw Creek and East Beacon Spring encompasses most of the riparian areas within this pasture. Deferred rotation grazing would be applied to uses areas within this pasture. Livestock would graze the upper East Squaw Creek and East Beacon spring areas between May 1 and July 31, and then move north to the Baker Spring/Pipeline area. The Baker Spring/Pipeline area would be grazed from as early as July 1 to September 30 in conjunction with the Railroad and Windmill Seeding Fields. The permittee would be responsible for monitoring livestock drift outside the planned use area(s) and moving them back to the planned use area(s) in a timely manner. Removing livestock drifting back into the East Squaw Creek and East Beacon Spring areas would be particularly important during the interim grazing system period.

Railroad Field and Windmill Seeding Field. The interim grazing system calls for these two fields to be used in conjunction with the Baker Spring Use Area in the North Pequop Mountain Pasture. These two fields would need to supplement the forage for summer use when the livestock are not to be grazing the Upper East Squaw Creek and East Beacon Spring use areas in the North Pequop Mountain Pasture.

Squaw Creek Ranch Field. This field includes a portion of East Squaw Creek and would be managed as a riparian pasture with use limited to no more than three weeks. Monitoring of the utilization on streambank herbaceous riparian plants and willows would be used to determine if further adjustments would be made in order to achieve proper functioning condition and habitat objectives. The grazing of this riparian pasture would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture.

Lower Squaw Creek Ranch Field. This field has been irrigated to grow meadow grasses for livestock use in late summer/fall. This field would continue to be irrigated by the permittee and grazed up to three weeks between August 1 and October 31. The grazing of this field would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this field.

Collar and Elbow Pasture. This pasture would be used beginning on or after August 15 for late summer/fall/early winter use. The valley portions of this pasture tend to be dusty when the dry surface is disturbed during summer/fall. To avoid dust pneumonia in the calves, the permittee plans to wean the calves from the mother cows, generally around August 20 or later, before placing the mother cows in this pasture.

North of Home Pasture. Use in this pasture is generally trailing livestock to and from other pastures; however, some livestock may periodically be held in this pasture for a longer period of time. Because of the variability in the use of this pasture, the grazing of this pasture would be planned on an annual basis through a coordinated effort between the permittee and the Elko Field Office personnel prior to use in this pasture. If this pasture is to be grazed annually during the critical growth period for key forage species (May 1 to June 30), utilization would be managed so as not to exceed 40 percent. If this pasture is deferred at least two out of four years until July 1, utilization would be managed so as not to exceed 50 percent. Planned use would be directed toward maintaining healthy forage plants and a stable watershed for the Source Water Area Protection Zone associated with the watershed that supplies water to West Wendover, Nevada.

Final Grazing Plan

The final grazing plan would continue deferred rotation practices in those pastures scheduled for use during the critical growing season (**Table 2-25**). The final grazing system for East Big Springs incorporates new water sources to expand grazing distribution, new seedings to increase forage and habitat around the water sources, and additional fencing to protect riparian habitat and new seedings to improve the management of livestock under the deferred rotation practices as outlined below.

Table 2 - 25: East Big Springs Allotment Final Grazing System

PASTURE/USE AREA	YEARS 1 & 2	YEARS 3 & 4
Shafter	10/01 - 4/15	10/01 - 4/15
East Pequop Bench		
North Bench/Seeding/Long Canyon	05/01 - 07/15	03/01 - 05/15 09/01 - 12/31
South Bench/Seeding/Hardy Creek	05/01 - 07/15	03/01 - 05/15 09/01 - 12/31
Pipeline seeding	03/01 - 05/15 09/01 - 12/31	05/01 - 07/15
Pipeline native	03/01 - 05/15	05/01 - 07/15
Payne Basin	05/16 - 09/30	07/01 - 09/30
Six-Mile Canyon	Period of use to be defined on an annual basis.	Period of use to be defined on an annual basis.
East Squaw Creek		
South seeding	04/01 - 10/15 Period of use to be defined on an annual basis.	04/01 - 10/15 Period of use to be defined on an annual basis.
North native	05/01 - 10/15	07/01 - 10/15
North Pequop Mountain		
East Beacon/South Squaw Creek	05/01 - 07/31	07/01 - 09/30
North Squaw Creek/Baker Spring	07/01 - 09/30	05/01 - 07/31
Upper Squaw Creek riparian	Initially rest until proper functioning condition (PFC), then Up to 3 Weeks 05/01 - 07/31[1]	Initially rest until PFC, then Up to 3 Weeks 05/01 - 07/31[1]
Squaw Creek Ranch	Up to 3 Weeks 05/01 - 07/31[1]	Up to 3 Weeks 05/01 - 07/31[1]
Lower Squaw Creek Ranch	Up to 3 Weeks 08/01 - 10/31	Up to 3 Weeks 08/01 - 10/31
Windmill Seeding	04/01 - 10/31 Period of use to be defined on an annual basis.	04/01 - 10/31 Period of use to be defined on an annual basis.
Railroad Seeding	07/01 - 10/31	05/01 - 10/31
Collar & Elbow	08/15 - 01/31	08/15 - 01/31
North of Home	Period of use to be defined on an annual basis.	Period of use to be defined on an annual basis.

[1]The following stubble height/utilization limits would apply:
- Stubble Height of Herbaceous Riparian Species: A minimum of four inches average stubble height of selected key herbaceous riparian species (sedges/rushes) would be left along the streambank at the end of the growing season or grazing season, whichever occurs later.
- Willow Utilization: Do not exceed 35 percent average utilization of the total current year's leader growth on the portion of the willow within five feet of ground level by the end of the growing season or grazing season, whichever occurs later.
- Aspen Utilization: Do not use more than 30 percent of available aspen stems by the end of the growing season or grazing season, whichever occurs later.

1. Construct the range improvement projects outlined in **Table 2-26** within the East Big Springs Allotments.
2. Continue to conduct necessary monitoring studies and periodically evaluate the effects of grazing to

Table 2 - 26: Proposed Range Improvements for the East Big Springs Allotment

Project	Units
Long Canyon drift fence	¼ mile
Burnt Well storage tank (8,000 gallons)	1 ea
Oasis seeding	3,000 ac
South Well storage tank (8,000 gallons)	1 ea
South Well Reservoir	1 ea
Lower Hardy Creek Well	1 ea
West Wendover pipeline seeding	4,000 ac
West Wendover seeding fence	7 miles
West Wendover pipeline extensions	4 ea
Six Mile Canyon drift fence	¼ mile
Enlarge Upper Six Mile Canyon Reservoir	1 ea
Lower Nanny Creek exclosure	¼ mile
Upper Nanny Creek exclosure	¼ mile
Adele Spring exclosure	¼ mile
Milk House Spring exclosure	¼ mile
East and West Big Springs boundary fence	3 miles
Lower Squaw Creek drift fence (East Squaw Creek Pasture)	2 ½ miles
East Squaw Creek pasture seeding	1,200 acres
North Squaw Creek pasture pipeline extension	3 miles
East Squaw Creek pasture fence	3 miles
Upper East Squaw Creek pasture fence	1 ½ miles
Pequop Exit drift fence	2 miles
East Squaw Creek riparian pasture fence	Approx. 6 miles
Middle Fork East Squaw Creek exclosure	½ mile
Lower Beacon Spring exclosure	¼ mile
Upper Beacon Spring exclosure	¼ mile
Upper Beacon Spring pipeline	1 mile
Wally Spring exclosure	¼ mile
East Squaw Creek Spring Complex exclosure	¼ mile
North Fork East Squaw Creek exclosure	1 mile
North Pequop Mountain Well pipeline extension	2 miles
Squaw Creek Ranch Field boundary fence reconstruction/relocation	Approx. 4 miles
Noxious Weed Treatments	To be determined
Spring developments/exclosures (as prioritized)	To be determined

determine if progress is being made in meeting the multiple use objectives and standards for rangeland health. The Big Springs Allotment(s) would be re-evaluated in accordance with priorities established in the Elko Field Office Monitoring and Evaluation Schedule:

(a) Establish new key areas or conduct supplemental studies in the select locations.

(b) Studies would be conducted in accordance with BLM policy manual guidance as outlined in the *Nevada Rangeland Monitoring Handbook* and other technical references.

Within the East Pequop Bench Pasture the North Bench Use Area was created by the fire rehabilitation fence and seeding. Additional range improvements within this pasture would include approximately ¼-mile or less of drift fence near the bottom of Long Canyon, an 8,000-gallon water storage tank to Burnt Well, a reservoir for the vicinity of South Well to catch spring runoff, an 8,000-gallon water storage tank would be added to South Well, a new well would be developed in the lower Hardy Creek area, and four pipeline extensions of approximately 1.5 miles each from the West Wendover water pipeline to provide water to the new seeding area to thenorth and native range to the south. Two seedings, one of up to 3,000 acres within the area burned in the Oasis fire within the South Bench Use Area, and one of up to 4,000 acres north of the West Wendover water pipeline, are proposed. The seedings would include shrubs, semi-shrubs, perennial forage grasses, and forbs. In addition, seven miles of fence to encompass the new seeding north of the pipeline are proposed. Once these developments are installed, the East Pequop Bench Pasture, late summer and fall use is proposed for this pasture.

Within Payne Basin Pasture, the Adele, Milk House, and Upper and Lower Nanny springs would be permanently fenced. In addition, existing spring developments that remove all the water from the spring source would be evaluated to determine if the spring developments warrant modification to encourage the growth of riparian vegetation at the spring sources.

The only proposed new project within the Six Mile Canyon Pasture is a drift fence of approximately ¼-mile at the bottom of the canyon. However, the two existing reservoirs within the canyon would be repaired and/or enlarged where feasible.

The range improvements proposed for East Squaw Creek Pasture include a drift fence to separate the South Seeding Use Area from the native range to the north. The fence would extend easterly from the Lower Squaw Creek Field to the fence along the highway to Montello (Route 233), and would be constructed to allow access from either side to the reservoir in Lower Squaw Creek Field. The existing seeding in the southern portion of the pasture would be increased by up to 1,200 acres. The area would be seeded with desirable perennial grasses and forage kochia.

In the North Pequop Mountain Pasture a boundary fence between the East and West Big Springs allotments would be constructed from Interstate 80 at Pequop Summit to Rocky Point, a distance of approximately three miles. This would be a let-down fence to facilitate deer fall and spring movements. Another let-down fence would be constructed from the boundary of the East and West Big Springs allotments and extend easterly to the Squaw Creek Ranch Field. Two miles of drift fence would be constructed from Interstate 80 at Pequop Summit toward the southwest corner of the Squaw Creek Ranch field. Six riparian fences or exclosures are also proposed, some of which have water developments associated with the exclosures. In addition, existing spring developments that remove all the water from the spring source would be evaluated to determine if the spring developments warrant modification to encourage the growth of riparian vegetation at the spring sources. A pipeline extension from the proposed

well at the north end of the pasture to a location east of the boundary between the two allotments would be constructed.

Within the Upper Squaw Creek Riparian Pasture a water gap at the lower end of the riparian pasture fence would be considered in the design of the fence to provide water for use in the North Squaw Creek and South Squaw Creek pastures.

No specific range improvements are proposed for the Squaw Creek Ranch Field; however, existing fences would be considered for relocation to create a riparian pasture of width similar to the Upper Riparian Pasture.

2.4.2.2 Other Management Actions

The MUD also included actions and decisions with respect to watershed protection, wildlife, and wild horses, which are summarized below.

1. Drinking Water Source Protection Plan for the City of West Wendover, Nevada. The BLM agrees not to locate or allow the location of any Potential Contamination Sources (PCS), as defined by the United States Environmental Protection Agency and the Nevada Division of Environmental Protection, in Protection Zones 1, 2 ,3, and 4, so far as this is consistent with the authority granted to BLM to regulate public land activities.

2. Modify the wire spacing on the West Pequop Bench Fence (#5608) to meet current BLM specifications. On three-wire fences, the wire spacing would be 18"-8"-12" from the ground up, and the bottom wire would be smooth. On four-wire fences, the wire spacing would be 16"-6"-8"-12" from the ground up, and the bottom wire would be smooth.

3. Inventory the remaining fences on public lands and modify those fences to BLM specifications as needed to facilitate the movement of big game.

4. Modify existing fences and design new fences to facilitate the movement of deer, antelope, and elk, and to reduce maintenance costs.

5. Improve forage diversity for antelope through the seeding of grass, shrub, semi-shrub and forb seeds. The areas to be seeded would be associated with the water developments in the Independence Valley and Holborn Pastures of the West Big Springs Allotment, and the East Pequop Bench and East Squaw Creek Pastures of the East Big Springs Allotment as described under the Livestock Grazing Management section above.

6. Install additional big game guzzlers to provide more water locations and to attract big game to areas little used by livestock. The specific locations for new water guzzlers would be identified at a later date.

7. Establish an AML range for wild horses of 34 to 56 wild horses for 12 months (408 to 672 AUMs) within that portion of the Goshute HMA in the Shafter Pasture of the Big Springs Allotment.

8. Prepare a Population Management Plan to guide the management of wild horses within the Goshute Herd Area to ensure that wild horse populations maintain their free-roaming, self-sustaining, genetically viable status.

9. Inventory, identify, and eliminate existing wire hazards. Clean up and dispose of old wire, especially where it creates a significant hazard to wild horses.

10. Continue to collect pre-livestock use by wild horses and combined use (cattle and horses) utilization data.

11. Continue to collect seasonal distribution and census data on the Goshute HMA. Continue to collect seasonal distribution

and census data on horse populations that are occupying areas managed as horse-free.

12. Do not construct the fence described in the Wells RMP Wild Horse Amendment that was intended to prevent wild horses from drifting north into the checkerboard land pattern of the Goshute Herd Management Area.

2.4.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the spring exclosures and associated troughs proposed in Alternative 2 would not be constructed. Spring use would be rotated between Payne Basin and East Squaw Creek Riparian pastures (East Big Springs Allotment) with rest on alternate years. Spring use would be rotated between Holborn and West Squaw Creek Riparian Pastures (West Big Springs Allotment) with rest in alternate years. Deferred use would occur in North Pequop Mountain Pasture. All other spring/summer/fall pastures would follow a deferred rotation system

2.4.3.1 Grazing Management Decisions

The actions proposed for the Big Springs Allotment under Alternative 3 include:

1. Divide the Big Springs Allotment into two separate allotments called East and West Big Springs Allotments with the dividing line on the crest/watershed divide, or nearly so, of the Pequop Mountains. If fences are constructed to separate all or a portion of these two allotments, the dividing line created by the new fence(s) would be considered the actual allotment boundary.

2. Establish carrying capacity for each pasture as indicated in **Table 2-27**.

Table 2 - 27: Alternative 3 - Carrying Capacity by Pasture - Big Springs Allotment

Pasture	Carrying Capacity (AUMs)
Independence Valley	3,050 (2,750)*
Holborn	550
West Squaw Creek Riparian	399
North Pequop Mountain	769 (West Side)
	1,139 (East Side)
Railroad Field	255
Windmill Field	420
East Squaw Creek Riparian	623
East Squaw Creek	330
Collar & Elbow	1,899
Shafter	3,396
Squaw Creek Ranch	55
Lower Squaw Creek Ranch	100
North of Home	116
Payne Basin/Six Mile	756
East Pequop Bench	3,069
Fenced Federal Range (FFR)	20 (West Side)
	17 (East Side)

* 3,050 AUMs authorized if stockwater is hauled to northwest portion of valley or if a new water source is developed in this area.

3. The range improvements identified in **Table 2-28** would be constructed under this alternative (**Map 2-7, Appendix A**). Some of the same range improvements proposed in Alternative 2, are included in this alternative, except for the West Squaw Creek Riparian Fence, which is a new project.

4. The permitted use would be established as indicated in **Table 2-29**.

5. The grazing system proposed under Alternative 3 is provided in **Table 2-30**. The combination of the East and West Big Springs Boundary Fence, the Upper East Squaw Creek Pasture Fence, and the West Squaw Creek Pasture Fence would create two riparian pastures encompassing the East and West Squaw Creek drainages. These fences would

Table 2 - 28: Range Improvements for the East and West Big Springs Allotments - Alternative 3

Project	Units
East Big Springs Allotment	
Long Canyon Drift Fence	¼ miles
Burnt Well Storage Tank	8,000 gallons
South Well Storage Tank (8,000 gallons)	1 ea
South Well Reservoir	1 ea
Lower Hardy Creek Well	1 ea
West Wendover Pipeline Extensions	4 ea
Six Mile Canyon Drift Fence	¼ miles
Enlarge Upper Six Mile Canyon Reservoir	1 ea
East and West Big Springs Boundary Fence	3 miles
Lower Squaw Creek Drift Fence (East Squaw Creek Pasture)	2 ½ miles
North Squaw Creek Pasture Pipeline Extension	3 miles
East Squaw Creek Pasture Fence	3 miles
Pequop Exit Drift Fence	2 miles
North Fork East Squaw Creek Exclosure	1 mile
North Pequop Mountain Well Pipeline Extension	2 miles
Noxious Weed Treatments	N/A
Other Spring Exclosures/Developments	N/A
West Big Springs Allotment	
Independence Valley Well	1 ea
East and West Big Springs Boundary Fence	3 miles
North Pequop Mountain Well	1 ea
Pequop Mountain Bench Well	1 ea
Pequop Well Storage Tank	1 ea
Spring Developments/Exclosures (as prioritized)	n/a
West Squaw Creek Riparian Fence	4 miles

Table 2 - 29: Big Springs Allotment - Permitted Use Under Alternative 3

Allotment	Permitted use under this alternative*
West Big Springs	4,389
East Big Springs	11,419

*These figures include FFR AUMs

Table 2 - 30: Big Springs Allotment - Alternative 3 Grazing System

Pasture	Years 1 and 3	Years 2 and 4	# Livestock*	AUMs
East Big Springs Allotment				
Shafter	10/1-4/15	10/1-4/15	602	3,396
East Pequop Bench	4/1-7/31	4/1-7/31	879	3,069
Payne Basin	No use	5/1-6/30	357	623
East Squaw Creek Riparian	5/1-6/30	No use	357	623
North Pequop Mountain	7/1-9/30	7/1-9/30	433	1,139
Collar & Elbow	8/15-1/31	8/15-1/31	390	1,899
East Squaw Creek	7/1-9/30	7/1-9/30	125	330
Railroad Field	7/1-9/30	7/1-9/30	97	255
Windmill	7/1-9/30	7/1-9/30	159	420
Squaw Creek Ranch	Up to 3 Weeks 5/1-7/31	Up to 3 Weeks 5/1-7/31	**	55
Lower Squaw Creek Ranch	Up to 3 Weeks 8/1-10/31	Up to 3 Weeks 8/1-10/31	**	100
North of Home	Period of use to be defined on an annual basis	Period of use to be defined on an annual basis	**	116
West Big Springs Allotment				
Independence Valley	9/15-6/30	9/15-6/30	519	3,050
W. Squaw Creek	No use	5/1-6/30	337	399
Holborn**	5/1-6/30 9/15-9/30	No Spring Use 9/15-9/30	337 488	550 151
North Pequop Mountain	7/1-9/30	7/1-9/30	431	769

***** This is the maximum number of cattle that can be run in this date range in each pasture. Actual numbers would be determined through the annual grazing planning and application process. These figures assume percent public land remains at 87 percent (East Side) and 59 percent (West Side). Livestock numbers may decrease if percent public land increases.

** Holborn pasture would be used early every other year and late every year. Use in spring and fall years would be 550 AUMs, and use in fall only years would be 151 AUMs.

allow for the implementation of a grazing system with spring use every other year in these pastures, with rest years in alternate years. Holborn Pasture in the West Big Springs allotment and Payne Basin in the East Big Springs Allotment would be grazed during the spring on years when the Squaw Creek Riparian pastures are rested and would be rested in the years that the Squaw Creek Riparian pastures are grazed. This grazing use would allow the spring complexes in the East Big Springs Allotment to remain unfenced except for one complex in the North Fork of East Squaw Creek that would be north of the pasture fence. Therefore, this complex would be in an area to receive hot season use on a yearly basis. Grazing use in all other spring/summer/fall pastures would continue under the deferred use rotational patterns, allowing those pastures to complete two full growing seasons before the onset of grazing in two years out of four. North Pequop Mountain and Collar and Elbow

pastures would continue to receive deferred use every year. The water developments proposed would provide additional water sources for livestock and wildlife across both allotments. Permitted use in both allotments would drop to account for the AUMs that would not be available on an annual basis due to the rested pastures.

Carrying capacity for each pasture would remain the same as in the MUD, with the North Pequop Mountain AUMs split between the new riparian pastures.

2.4.3.2 Other Management Actions

The management actions included in Section 2.4.2.2 would also be included as part of the alternative.

2.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, sensitive species habitats have been identified where Rangeland Health Standards were not being met and/or significant progress was not being made, and livestock were determined to be the causal factor. The grazing system would be adjusted to permit 3,951 AUMs in the West Big Springs Allotment and 10,521 AUMs in the East Big Springs Allotment.

2.4.4.1 Grazing Management Decisions

The actions proposed for the Big Springs Allotment under Alternative 4 include:

1. Divide the Big Springs Allotment into two separate allotments called East and West Big Springs Allotments with the dividing line on the crest/watershed divide, or nearly so, of the Pequop Mountains. If fences are constructed to separate all or a portion of these two allotments, the dividing line created by the new fence(s) would be considered the actual allotment boundary (**Map 2-8, Appendix A**).

2. Establish carrying capacity for each pasture as indicated in **Table 2-31**.

3. The range improvements identified in **Table 2-32** would be constructed under this alternative. Some of the same range improvements proposed in Alternative 2, are included in this alternative, except for the Seeding Protection Fences, which are new projects.

4. The grazing system proposed under Alternative 4. is provided in Table **2-33**. The grazing system would implement rotational deferred use in Independence Valley and East Pequop Bench pastures during the critical growing season. Use in all other pastures would occur either after the end of the growing season or during the dormant season.

   Use in North Pequop Mountain pasture would be limited to September 15 to October 31 annually to eliminate any potential livestock impacts to sage grouse nesting and summer brood habitat in that pasture. Grazing use in the portion of the East Pequop Bench pasture that contains sage grouse leks would occur after the end of the sage grouse strutting and early brood rearing periods, at which time these birds have normally moved into the adjacent fenced private fields. This alternative would eliminate all proposed fencing in the North Pequop Mountain pasture. The two permittees would be responsible for monitoring drift across the allotment boundary, both on the divide between East and West Squaw creeks and in the flats off the north end of the Pequop Mountains. Payne Basin pasture would be used every other year during the spring.

   The grazing system would eliminate the need for fencing the spring complexes in North Pequop Mountain and Payne Basin pastures. The water projects would provide additional water sources for wildlife and livestock. The proposed seedings would use native plants to the

extent that selected species could be expected to survive in adequate numbers to meet objectives. Some of the seedings not already enclosed within pasture fences may need additional temporary and/or permanent protection fence to allow those seedings to establish. AUMs

Table 2 - 31: Alternative 4 - Carrying Capacity by Pasture - Big Springs Allotment

Pasture	Carrying Capacity (AUMs)
Independence Valley	3,050 (2,750)*
Holborn	550
North Pequop Mountain	1,168 (West Side)
	1,762 (East Side)
Railroad Field	255
Windmill Field	420
East Squaw Creek	330
Collar & Elbow	1,899
Shafter	3,396
Squaw Creek Ranch	55
Lower Squaw Creek Ranch	100
North of Home	116
Payne Basin/Six Mile	756
East Pequop Bench	3,069
FFR	20 (West Side)
	17 (East Side)

*3,050 AUMs authorized if stockwater is hauled to northwest portion of valley or if a new water source is developed in this area.

Table 2 - 32: Range Improvements for the East and West Big Springs Allotments - Alternative 4

Project	Units
East Big Springs Allotment	
Oasis Seeding	3,000 acres
West Wendover Pipeline Seeding	4,000 acres
Long Canyon Drift Fence	¼ miles
Burnt Well Storage Tank	8,000 gallons
South Well Storage Tank (8,000 gallons)	1 ea
South Well Reservoir	1 ea
Lower Hardy Creek Well	1 ea
West Wendover Seeding Fence	7 miles
West Wendover Pipeline Extensions	4 ea
Six Mile Canyon Drift Fence	¼ mile
Enlarge Upper Six Mile Canyon Reservoir	1 ea
Pequop Exit Drift Fence	2 miles
North Pequop Mountain Well Pipeline Extension	2 miles

Project	Units
Noxious Weed Treatments	N/A
Other Spring Exclosures/Developments	N/A
West Big Springs Allotment	
Independence Valley Well	1 ea
Independence Valley Seeding	4,000 acres
Holborn Seeding	1,000 acres
North Pequop Mountain Well	1 ea
Pequop Mountain Bench Well	1 ea
Pequop Well Storage Tank	1 ea
Pequop Well Storage Tank	1 ea
Spring Developments/Exclosures (as prioritized)	n/a
Seeding Protection Fences	As needed

Table 2 - 33: Big Springs Allotment - Alternative 4 Grazing System

Pasture	Years 1 and 3	Years 2 and 4	# Livestock[1]	AUMs
East Big Springs Allotment				
Shafter	11/1-4/15	11/1-4/15	715	3,395
East Pequop Bench[2]	4/15-4/30 6/6 – 8/31	4/15-8/31	715	2,843 2,106
Payne Basin	5/1-6/5	No use	715	737
East Squaw Creek	8/15-9/15	8/15-9/15	360	329
Windmill Seeding	8/15-9/15	8/15-9/15	355	325
North Pequop Mountain	9/15-10/31	9/15-10/31	715	961
Railroad Field	7/1-9/30	7/1-9/30	190	255
Collar and Elbow	9/1-1/31	9/1-1/31	434	1,899
Squaw Creek Ranch	Up to 3 Weeks 5/1-7/31	Up to 3 Weeks 5/1-7/31	**	55
Lower Squaw Creek Ranch	Up to 3 Weeks 8/1-10/31	Up to 3 Weeks 8/1-10/31	**	100
North of Home	Period of use to be defined on an annual basis	Period of use to be defined on an annual basis	**	116
West Big Springs Allotment				
Independence Valley	11/1-7/14	11/1-7/14	363	1,803
Holborn	7/15-9/14 11/1-11/15	7/15-9/14 11/1-11/15	363	550
North Pequop Mountain	9/15-10/31	9/15-10/31	363	331

[1]These figures assume the percent public land remains at 86 percent (East Big Springs Allotment) and 59 percent (West Big Springs Allotment). Livestock numbers may decrease if the public land increases.

[2] Use in East Pequop Bench Pasture would be rotated as described in the MUD except for the area burned in the 2000 Big Springs fire, which would be deferred to last every year so that livestock do not affect sage grouse strutting grounds located in the southern end of this field.

would be reduced on both allotments to account for the reduced use in the North Pequop Mountain pasture.

2.4.4.2 Other Management Actions

The management actions included in Section 2.4.2.2 would also be included as part of the alternative.

2.5 Owyhee Allotment

The Owyhee Allotment is approximately 376,270 acres, of which 371,431 acres are public lands (98.7 percent public lands), and is located in the northwest corner of the public lands managed by BLM's Elko Field Office, along the Idaho-Nevada border (**Map 2-1, Appendix A**).

2.5.1 Alternative 1 - Re-issue Grazing Permits at Historic Levels

Under this alternative, BLM would continue to implement the existing grazing management strategies. However, the allotment evaluation analysis determined that the No Action Alternative was not achieving some of the Rangeland Health Standards or making significant progress toward some of the allotment objectives. Therefore, the No Action Alternative is not considered a viable alternative for selection, but does provide the baseline condition to which the EIS action alternatives may be compared. The No Action Alternative grazing system for the Owyhee Allotment is described below.

The active grazing use for the allotment was 30,155 AUMs, but the permittee also had 1,692 AUMs that had been historically suspended. An AMP was developed in 1987, but was not completely implemented until 1990 after the fences necessary to implement the system were constructed (**Map 2-9, Appendix A**). The cross fencing resulted in five native pastures (Star Ridge, Dry Creek, Chimney Creek, and Upper and Lower Fourmile Pastures), and one seeding pasture (Winters Creek Seeding). The AMP implemented a combination of rest-rotation and deferred-rotation system to provide growing season rest in each of the native pastures one year out of two. The rest-rotation use on both the Star Ridge and Dry Creek pastures outlined in the AMP is from March 1 to August 15. However, in order to reduce the hot season grazing use on the South Fork Owyhee River, the ranch has voluntarily ceased grazing use by June 30, within the Star Ridge Pasture since 1995. Deferred-rotation use on the Lower and Upper Fourmile and Chimney Creek pastures is from March 1 to May 15 and November 15 to January 31 one year and August 16 to October 15 the next year.

Under this alternative, the average actual use between 1981 and 1999 on this allotment was 18,862 AUMs, with a low of 10,247 AUMs and a high of 29,379 AUMs.

Fence modifications and mitigation proposals that were developed as a result of field monitoring would still be viable under this alternative. This includes addition of three-inch wide metal stays to existing fence spans with all t-posts spaced as far as 22 feet apart, and painting the tops of the t-posts within a mile of four sage grouse leks with white enamel paint.

2.5.2 Alternative 2 - Implement the Multiple Use Decision

The following is a summary of the MUD for the Owyhee Allotment. Detailed descriptions, discussions, and rationales for these decisions are included in the *Final Multiple Use Decision for the Owyhee Allotment* (BLM 2002), which is incorporated herein by reference.

2.5.2.1 Grazing Management Decisions

The actions proposed for the Owyhee Allotment include:

1. Vacate the 1987 Allotment Management Plan for the Owyhee Allotment.
2. Establish permitted livestock use within the Allotment as indicated in **Table 2-34**.
3. Implement the rest rotation and deferred grazing system for the Owyhee Allotment as outlined in **Table 2-35**.

Table 2 - 34: Alternative 2 - Owyhee Allotment Authorized Use and Period of Use

Allotment	Livestock Number & Kind	Begin Period[1]	End Period[1]	%PL	Type Use	AUMs
Owyhee	3,053 Cattle	2/15	2/28	98	Active	1,377
	3,053 Cattle	3/1	12/15	98	Active	28,526
Total						29,903

[1] Grazing use will be in accordance with the prescribed grazing system which outlines the period of use and AUMs allocated for each pasture.

Table 2 - 35: Alternative 2 - Owyhee Allotment Grazing System

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	% Public Land	Type Use	AUMs
1	Star Ridge	2,761 Cattle	2/15	2/28	98	Active	1,245
		2,761 Cattle	3/1	6/30	98	Active	10,856
	Chimney Creek	1,709 Cattle	3/1	5/15[1]	98	Active	4,184
		1,709 Cattle	10/16	12/15	98	Active	3,359
	Lower 4-mile	1,857 Cattle	7/1	10/15	98	Active	6,403
	Upper 4-mile	181 Cattle	7/1	10/15	98	Active	625
		48 Horses	3/1	12/15	98	Active	444
	Winters Creek Seeding	518 Cattle	3/1	5/30	98	Active	1,518
		518 Cattle	10/1	12/15	98	Active	1,269
	Dry Creek						Rest
Total							29,903
2	Dry Creek	1,872 Cattle	2/15	2/28	98	Active	844
		1,872 Cattle	3/1	7/31	98	Active	9,233
	Chimney Creek	3,838 Cattle	8/1	9/30	98	Active	7,543
	Lower 4-mile	1,307 Cattle	3/1	5/15	98	Active	3,201
		1,307 Cattle	10/1	12/15	98	Active	3,202
	Upper 4-mile	255 Cattle	3/1	5/15	98	Active	625
		48 Horses	3/1	12/15	98	Active	444
	Winters Creek Seeding	518 Cattle	3/1	5/30	98	Active	1,518
		518 Cattle	10/1	12/15	98	Active	1,269
	Star Ridge						Rest
Total							27,879

[1] After May 15, this herd of cattle would be moved onto the Lime Mountain and Cornucopia Allotments then onto private ground in the Columbia Basin

exception of the Star Ridge Pasture in which grazing use would not extend beyond June 30.

(c) Deviations from the grazing system beyond the flexibility outlined above would be allowed to meet the needs of the resources and the permittee as long as these deviations are consistent with multiple use objectives. Deviations beyond the limits of the flexibility outlined above, including deviations in turnout date, increases in livestock numbers and deviation from the grazing system, would require an application, and written authorization from the Assistant Field manager for Renewable Resources prior to grazing use.

4. To facilitate the grazing system, the range improvement projects listed in **Table 2-36** and displayed on **Map 2-10, Appendix A** would be constructed. Permittees would be assigned

Table 2 - 36: Alternative 2 - Owyhee Allotment - Proposed Range Improvements

Proposed Project	Pasture	Units
Star Ridge Well & pipeline	Star Ridge	1 well 3 miles pipeline
Star Valley Well pipeline extension	Star Ridge	3 miles of pipeline from existing well.
Pipeline extension	Dry Creek	2 miles of pipeline from proposed well located on private land.
Winters Creek seeding Well pipeline extension	Dry Creek	2 miles of pipeline from existing well in Winters Creek Seeding.
Pipeline extension	Dry Creek	2 miles of pipeline from existing well on private land.
Exxon storage tank pipeline extension	Chimney Creek, Winters Creek Seeding	2 miles of pipeline extension from Exxon Storage Tank.
Exxon Well pipeline extension	Chimney Creek, Lower Fourmile	1 mile of pipeline extension from Exxon Well.
South Fork Owyhee River gap fence	Lower Fourmile	4 miles of gap fence.
Fourmile Butte Well and pipeline	Lower Fourmile	1 well 9.5 miles of pipeline
Mechanical Shrub Thinning and Seeding with Native Species	Selected Areas on Entire Allotment	Approximately 4,000 acres
Seven Wildlife Water Developments	Star Ridge (4), Chimney Creek (3)	7 each
Fence Modifications to Facilitate Wildlife Movements	Upper and Lower Fourmile	4.5 miles
Mitigate Effects of Existing Fences on Wildlife (Flight Diverters)	Star Ridge, Dry Creek, Winters Creek Seeding	14 miles
Bookkeeper Spring development & exclosure	Dry Creek	2 miles of fence Spring development

Maintenance of existing range improvement projects. Maintenance of future range improvements would be assigned to the party(s) deriving primary benefits.

2.5.2.2 Other Management Actions

The MUD also included actions and decisions with respect to wildlife and wild horses, which are summarized below.

1. Develop additional water developments (guzzlers) for use by wildlife. Consider four sites on Star Ridge Pasture and three sites in the southern portion of the Chimney Creek pasture.
2. Increase forage diversity and herbaceous cover for wildlife and herbaceous forage for livestock by creating a mosaic pattern of vegetation successional stages through vegetative manipulation practices.
3. Identify and prioritize any needed fence project modifications that do not meet BLM specifications starting with the pasture division fence between Upper and Lower Fourmile Pastures.

   Complete actions to mitigate the effects on wildlife resources due to man-made structures within the allotment. Identify

existing BLM range improvements near documented key sage grouse habitat areas and prioritize them for predatory bird-proofing. These actions would include completion of measures on allotment and pasture fence braces and horizontal/vertical corral/guzzler posts, leveling pit reservoir berms (without compromising water holding/catching ability), or relocating corrals through consultation with the permittee. Actions to visually outline projects to minimize collisions where needed, would include painting t-post fence tops white or addition of fence stays to make the fence more visible to sage grouse or other wildlife that travel/fly during periods of low or no light. Complete these actions starting with fence projects and structures near Twelvemile Flat, Silver Lake and Corral Lake leks.

4. Consider relocation of water sources away from Wet Clay Basin 8-10" P.Z. (precipitation zone) Ecological Sites on vegetated playas. Existing pit reservoirson vegetated playas would be allowed to naturally fill in, with no further mechanical improvements to be authorized.

5. Establish two additional upland monitoring sites within the Star Ridge Pasture, one additional monitoring site within the Chimney Creek Pasture and one additional monitoring site (AY-1-02) on Silver Lake within the Dry Creek Pasture.

6. The AML for the Owyhee HMA is 139 to 231 wild horses. **Table 2-37** identifies how the AUMs for wild horses are allocated within the Owyhee Allotment.

7. Prepare a population management plan to guide the management of wild horses within the Owyhee Herd Area.

Table 2 - 37: Alternative 2 - Owyhee Allotment – Appropriate Management Levels for Wild Horses

Pasture	Season of Use	Wild Horse Numbers	Wild Horse AUMs
Star Ridge	3/1-2/28	75 - 125	900 - 1,496
Dry Creek	3/1-2/28	44 - 73	528 - 876
Chimney Creek	3/1-2/28	20 - 33	240 - 397
	Total	139 - 231	1,668 - 2,769

2.5.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge Pastures would be obtained without constructing the proposed riparian fence in the Lower Fourmile Pasture (**Map 2-13**). The riparian fences and vegetation treatments proposed in the MUD would not be implemented. However, it would be necessary to implement the projects listed in the Owyhee Allotment Evaluation for the Dry Creek Pasture, including eight miles of pipeline extensions. It would also be necessary to develop an additional well and pipeline system in order to extend use past July 31 (and earlier in many years) for 3,000 head of cattle in a 179,243 acre pasture. The wildlife vegetation treatments to increase vegetation diversity would not be conducted under this alternative.

Changes in the period of use for the Lower Fourmile, Upper Fourmile, and Star Ridge pasture are necessary to remove hot season grazing use on the South Fork Owyhee River in order to improve existing riparian habitat

conditions. This has already been done voluntarily by the permittee within the Star Ridge Pasture since 1995.

The proposed grazing system would still consist of a two-pasture rest-rotation system and a two-pasture deferred rotation system in even years and a one-pasture rest rotation and one-pasture deferred rotation in odd years. No substantial reduction in livestock AUMs would occur under this alternative.

2.5.3.1 Grazing Management Decisions

The actions proposed for the Owyhee Allotment under Alternative 3 include:

1. Implement the rest rotation and deferred grazing system for the Owyhee Allotment as indicated in **Table 2-38**.
2. To implement the grazing system, the range improvement projects listed in **Table 2-39** would be constructed.
3. Riparian pastures Star Ridge, and Lower Fourmile and Upper Fourmile, would receive riparian grazing treatments consisting of cessation of grazing by June 30 and May 15, respectively, combined with complete rest every other year.
4. Dry Creek Pasture would receive growing season deferment every year. One year out of two it would receive use into the winter.
5. Chimney Creek Pasture would receive growing season deferment every other year.
6. Winters Creek Seeding would receive late use (October to December) every year.
7. This alternative would require water developments in order to extend use into the summer, fall, and winter months in the Dry Creek Pasture.

2.5.3.2 Other Management Actions

Implement actions and decisions with respect to wildlife and wild horses, which are summarized below.

1. Develop additional water developments (guzzlers) for use by wildlife. Consider four sites on Star Ridge Pasture and three sites in the southern portion of the Chimney Creek pasture.
2. Identify and prioritize any needed fence project modifications that do not meet BLM specifications starting with the pasture division fence between Upper and Lower Fourmile Pastures.
3. Complete actions to mitigate the effects on wildlife resources due to man-made structures within the allotment. Identify existing BLM range improvements near documented key sage grouse habitat areas and prioritize them for predatory bird-proofing. These actions would include completion of measures on allotment and pasture fence braces and horizontal/vertical corral/guzzler posts, leveling pit reservoir berms (without compromising water holding/catching ability), or relocating corrals through consultation with the permittee. Actions to visually outline projects to minimize collisions where needed, would include painting t-post fence tops white or addition of fence stays to make the fence more visible to sage grouse or other wildlife that travel/fly during periods of low or no light. Complete these actions starting with fence projects and structures near Twelvemile Flat, Silver Lake and Corral Lake leks.
4. Consider relocation of water sources away from Wet Clay Basin 8-10" p.z. Ecological Sites on vegetated playas. Existing pit reservoirs on vegetated playas would be allowed to naturally fill in, with no further mechanical improvements to be authorized.

Table 2 - 38: Alternative 3 - Owyhee Allotment Grazing System

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	% Public Land	Type Use	AUMs
1	Lower 4-Mile	2,600 Cattle	3/1	5/15	98	Active	6,283
	Upper 4-Mile	400 Cattle	3/1	5/15	98	Active	966
	Chimney Creek	3,000 Cattle	5/16	8/1	98	Active	7,443
	Dry Creek	3,000 Cattle 1,000 Cattle	8/2 11/2	11/1 12/15	98 98	Active Active	8,796 1,224
	Winters Creek Seeding	2,000	11/2	12/15	98	Active	2,499
	Star Ridge						Rest
Total							27,211
2	Star Ridge	3,000 Cattle	3/1	6/30	98	Active	11,696
	Dry Creek	3,000 Cattle	7/1	9/30	98	Active	8,892
	Chimney Creek	2,500 Cattle	10/1	12/15	98	Active	6,041
	Winters Creek Seeding	500 Cattle	10/1	12/15	98	Active	1,208
	Upper Fourmile						Rest
	Lower Fourmile						Rest
Total							27,837

Table 2 - 39: Alternative 3 - Owyhee Allotment - Range Improvement Projects

Proposed Project	Pasture	Units
Star Ridge Well & pipeline	Star Ridge	1 well, 3 miles pipeline
Star Valley Well pipeline extension	Star Ridge	3 miles of pipeline from existing well
Pipeline extension	Dry Creek	2 miles of pipeline from proposed well located on private land
Winters Creek seeding Well pipeline extension	Dry Creek	2 miles of pipeline from existing well in Winters Creek Seeding
Pipeline extension	Dry Creek	2 miles of pipeline from existing well on private land
Exxon storage tank pipeline extension	Chimney Creek Winters Creek Seeding	2 miles of pipeline extension from Exxon Storage Tank
Exxon Well pipeline extension	Chimney Creek Lower Fourmile	1 mile of pipeline extension from Exxon Well
Dry Creek Well and pipeline	Dry Creek	1 well, 8 miles of pipeline
Wildlife Water Developments	Star Ridge (4), Chimney Creek (3)	7 ea
Fence Modifications to Facilitate Wildlife Movements	Upper and Lower Fourmile	4.5 miles
Mitigate Effects of Existing Fences on Wildlife (Flight Diverters)	Star Ridge, Dry Creek, Winters Creek Seeding	14 miles

Establish two additional upland monitoring sites within the Star Ridge Pasture, one additional monitoring site within the Chimney Creek Pasture and one additional monitoring site (AY-1-02) on Silver Lake within the Dry Creek Pasture.

5. Establish the appropriate management level for wild horses for the Owyhee Allotment and Owyhee Herd Area.

6. Prepare a population management plan to guide the management of wild horses within the Owyhee Herd Area

2.5.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, sensitive species habitats have been identified where Rangeland Health Standards were not being met and/or significant progress was not being made, and livestock were determined to be the causal factor. Under this alternative, riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge Pastures would be obtained without constructing the proposed fence in the Lower Fourmile Pasture (**Map 2-14**). The well and pipeline system in this pasture would not be constructed if the South Fork Owyhee River is not fenced, as livestock would have access to the river when in this pasture. The proposed grazing system would consist of a two-pasture restrotation system and a two-pasture deferred rotation system.

Changes in the period of use for the Lower Fourmile pasture would be necessary to remove hot season grazing use on the South Fork Owyhee River in order to improve existing riparian habitat conditions. This has already been done voluntarily by the permittee within the Star Ridge Pasture since 1995.

The proposed grazing system would still consist of a two-pasture, rest-rotation system and a two-pasture, deferred-rotation system. Under these systems, complete rest from livestock grazing or the deferment of grazing during the critical growth period of key management plant species would occur.

2.5.4.1 Grazing Management Decisions

1. The actions proposed for the Owyhee Allotment under Alternative 4 include Implement the rest-rotation and deferred grazing system for the Owyhee Allotment as outlined in **Table 2-40**.

2. To implement the grazing system, the range improvement projects listed in **Table 2-41** and displayed on **Map 2-12, Appendix A** would be constructed.

3. Riparian pastures (Star Ridge and Lower Fourmile) receive riparian grazing treatments consisting of cessation of grazing by June 30 and May 30, respectively, combined with complete rest every other year. Upper Fourmile Pasture would receive early winter use alternating with complete rest.

4. Dry Creek Pasture would receive rest every other year with summer use June 1 to July 31 every other year. This pasture would receive the same treatment as outlined in the MUD, but at a 30 percent reduction in cattle numbers.

5. Winters Creek Seeding would receive late use every year. This seeding could also receive spring use instead of late use, if needed.

Table 2 - 40: Alternative 4 - Owyhee Allotment Grazing System

Year	Pasture	Livestock Number & Kind	Begin Period	End Period	% Public Land	Type Use	AUMs
1	Lower 4-Mile	2,200 Cattle	3/1	5/30	98	Active	6,582
	Dry Creek	2,200 Cattle	6/1	7/31	98	Active	4,412
	Chimney Creek	2,200 Cattle	8/1	11/15	98	Active	7,543
	Winters Creek Seeding	2,200 Cattle	11/16	12/15	98	Active	2,169
	Upper Fourmile						Rest
	Star Ridge						Rest
Total							20,706
2	Star Ridge	2,200 Cattle	3/1	6/30	98	Active	8,752
	Chimney Creek	2,200 Cattle	7/1	10/14	98	Active	7,933
	Winters Creek Seeding[1]	2,200 Cattle	10/15	11/15	98	Active	2,224
	Upper 4-mile	2,200 Cattle	11/16	12/15	98	Active	1,157
	Lower Fourmile						Rest
	Dry Creek						Rest
Total							20,066

[1] Consider spring use on Winters Creek Seeding (crested wheatgrass). Dry Creek Pasture livestock use currently dependent on artificial water developments or water hauling. With no new pipelines, consider deferment out of seed ripe by switching dates with Winters Creek Seeding and Chimney Creek during "wet years" (when large capacity of water observed in stock ponds by mid May) per pro-rate of AUMs. If water developments constructed, defer use on Dry Creek until after seed ripe period (est. July 15 to July 31) per pro-rate of AUMs between the three pastures.

Table 2 - 41: Alternative 4 - Owyhee Allotment - Range Improvement Projects

Proposed Project	Pasture	Units
Mechanical Shrub Thinning and Seeding with Native Species	Selected Areas on Entire Allotment	Approx. 4,000 acres
Seven Wildlife Water Developments	Star Ridge (4), Chimney Creek (3)	Seven
Fence Modifications to Facilitate Wildlife Movements	Upper and Lower Fourmile	4.5 miles
Mitigate Effects of Existing Fences on Wildlife (Flight Diverters)	Star Ridge, Dry Creek, Winters Creek Seeding	14 miles

2.5.4.2 Other Management Actions

Implement actions and decisions with respect to wildlife and wild horses, which are the same as those described under Alternative 2 (Section 2.5.2.2).

2.6 Alternatives Considered but Eliminated from Detailed Analysis

2.6.1 No Grazing

The no grazing alternative would remove livestock from the public lands in identified grazing allotments. This alternative would not be in conformance with the livestock grazing management actions and decisions in the Elko or Wells RMPs. Further, the resource conditions, trends, and management objectives outlined in the Elko and Wells RMP can be reasonably met through the grazing management changes identified in the action alternatives evaluations. Therefore, the no grazing alternative is not considered further in this EIS.

2.6.2 Permit Grazing Based on Drought Conditions with Temporary Non-Renewable Use for Non-Drought Years

Currently the BLM has determined base level AUMs (i.e., carrying capacity) based on normal year production and has the discretionary authority to reduce grazing under drought conditions to protect resources as provided by the Code of Federal Regulations. For example, several allotments in the Sheep Allotment Complex were closed to grazing in 2003 based on BLM monitoring and prevailing drought conditions. These areas have not yet been re-opened, despite abundant rainfall in 2005, to allow for continued recovery from the lingering effects of drought.

This alternative would determine the carrying capacity based on productivity of the range sites during drought years. During non-drought years, the BLM would have discretion to increase the active AUMs through temporary non-renewable use permits, provided this use is consistent with multiple-use objectives.

Because the alternative system does not provide any real alternative to resource protection, this alternative is not considered further in the EIS.

2.6.3 Restore Non-Native Vegetation to Native Vegetation

Each of the subject allotments has seedings of non-native vegetation (crested wheatgrass), and/or areas of non-native annual grasses (cheat grass) which has established on burned or disturbed areas. One potential alternative suggested by the public was restoration of native vegetation to these sites.

BLM can address this issue during the allotment evaluation process, identify vegetation management as mitigation for any of the alternatives being considered, or propose and implement this action as a result of management decisions. Therefore, there is no need to develop this into a separate alternative, and this alternative is not considered further in the EIS.

2.6.4 Change Type of Livestock from Sheep to Cattle (Sheep Allotment Complex)

The public also identified changing the type of livestock on the Sheep Allotment Complex from sheep to cattle as an alternative to be considered. Sheep are primarily browsers in the winter and use a wide variety of shrubs. In contrast, cows are more limited in the shrubs that they use. The white sage would receive extensive use under this alternative.

Also, due to the lack of forage shrubs for cows, the number of AUMs would be greatly reduced to accommodate a conversion from sheep to cows.

In addition, sheep are generally tended by a herder to maintain the sheep in the areas

authorized for grazing. The habit of cows to drift would require additional fences to create pastures, rather than Use Areas, and fences to keep cows out of the residential areas near West Wendover. Additional wells and pipelines would be required if the conversion to cows is conducted.

Although there is a desire on the part of NDOW to reintroduce bighorn sheep into the Goshutes, this is currently not feasible because of disease transmission between domestic sheep and bighorn sheep.

The conversion of the grazing permits from sheep to cattle is not considered further in the EIS.

2.7 Past, Present, and Reasonably Foreseeable Future Actions

All of the allotments have been subject to historic grazing. Historic grazing of northern Nevada began in the 1860s and soon expanded in an unconfined, uncontrolled manner. Very little supplemental winter feed (hay) was harvested, and livestock depended on the open range for year-long forage (Young et al. 1979). By the early 1900s, the forest preserves were established, which were precursors to the national forests. As these forest preserves were established, restrictions were placed over the nomadic sheep operations.

Grazing continued at high levels into the 1900s until the passing of the Taylor Grazing Act in 1934. The Grazing Service (later to become the BLM) was directed to manage rangelands as a national resource. The BLM established grazing districts and allotments, and began implementation of range improvement projects.

Grazing, range improvement projects, and introductions of non-native, invasive species combined to alter the fire ecology of Great Basin rangelands.

2.7.1 Sheep Allotment Complex

2.7.1.1 Past and Present Actions

Past actions within the Sheep Allotment Complex include historic grazing, implementation of range improvements, change in fire ecology, operation of the railroad, and the development of Interstate 80 and Alternate Route 93.

The Sheep Allotment Complex has historically been used for livestock grazing. Water developments are scattered throughout the allotments, most in some state of disrepair. There are also numerous two-track roads, some associated with the grazing and water developments, and some associated with recreation.

The construction and operation of the railroad has also contributed to the current landscape. The Union Pacific railway currently extends through the north east portion of the Leppy Hills Allotment. Similarly, Interstate 80 and Alternate Route 93 traverse or border all of the allotments except Sugarloaf, Ferber Flat, and Utah/Nevada South allotments.

Livestock grazing, dispersed recreation, wildlife habitat, wild horses, and scientific study at the Hawkwatch International migration monitoring station are the major present land uses in the subject allotments. In addition, BLM has permitted motocross events within the allotments.

2.7.1.2 Reasonably Foreseeable Future Actions

The BLM would continue to authorize livestock grazing on the Sheep Allotment Complex and the range improvements proposed in the MUD that would facilitate this action. The BLM would also continue to suppress wild fires and would continue to implement rehabilitation measures to facilitate the recovery of burned areas. Wild horse numbers would be monitored and evaluated with respect to the AMLs and range condition.

The nearness of the Sheep Allotment Complex to West Wendover, Nevada increases the likelihood that the allotments within this complex would receive additional use for recreation as the population of West Wendover increases. This would include hunting, hiking, camping, and OHV use. Due to the checkerboard land status, there is also potential for ranchettes or subdevelopments to occur in the Leppy Hills and Utah/Nevada North allotments.

Nevada Department of Transportation may fence the right-of-way along Alternate Highway 93 in the southern portion of the Sheep Allotment Complex.

BLM may continue to authorize OHV events in the Sheep Allotment Complex, which could increase the popularity and use of this area by the public.

Mining exploration would continue and mineral development may increase within the Sheep Allotment Complex.

2.7.2 Big Springs Allotment

2.7.2.1 Past and Present Actions

Past actions within the Big Springs Allotment include historic grazing, implementation of range improvements and vegetation treatments, change in fire ecology, operation of the railroad, and the development of Interstate 80.

The construction and operation of the railroad has also contributed to the current landscape. The Union Pacific railway currently extends through Goshute Valley and portions of Independence Valley adjacent to the allotment. Similarly, Interstate 80 traverses or borders the allotment.

Livestock grazing, dispersed recreation, wildlife habitat, wild horses, and scientific study at the Hawkwatch International migration monitoring station are the major present land uses in the subject allotments.

2.7.2.2 Reasonably Foreseeable Future Actions

The BLM would continue to authorize livestock grazing on the Big Springs Allotments and the range improvements proposed in the MUD that would facilitate this action. The BLM would also continue to suppress wild fires and would continue to implement rehabilitation measures to facilitate the recovery of burned areas.

The allotment is not far from Wells, Nevada and use of the Big Springs Allotments for recreation in the future would be in response to changes in the population for Wells. Due to the deer migration route through the Pequop Mountains, hunting is already a major recreational use of the area and this would be expected to increase if Wells increases in population.

Private land along the interstate could be developed for ranchettes, commercial opportunities, or subdivisions.

2.7.3 Owyhee Allotment

2.7.3.1 Past and Present Actions

Past actions within the Owyhee Allotment include historic grazing, implementation of range improvements and vegetation treatments, and change in fire ecology.

The isolated location of the Owyhee Allotment has spared it from many of man's actions. Roads and reservoirs, irrigation, range improvements, and grazing have been the primary actions that have occurred on the allotment. More recently, an increase in off-road recreation, hunting, hiking, camping, and the pursuit of solitude has been noted. Limited mining exploration has also been authorized by the BLM.

BLM is currently taking actions to prevent the spread of unplanned fires, as well as rehabilitate recently burned areas. This includes aerial seeding of approximately 12,800 acres burned in the 2005 Wilson Complex Fire, which included approximately 50,000 acres in the Owyhee Allotment. Star Ridge Fuels Reduction project (mowing) was completed in September 2005 on 998 acres within the Star Ridge Pasture.

The Owyhee Greenstrip Mowing Project was completed in 2004 and 2005 on 675 acres within the Dry Creek Pasture.

Seven wildlife water developments (guzzlers) have been completed on the Dry Creek Pasture.

2.7.3.2 Reasonably Foreseeable Future Actions

The BLM would continue to authorize livestock grazing on the Owyhee Allotment and the range improvements proposed in the MUD that would facilitate this action. The BLM would also continue to suppress wild fires and would continue to implement rehabilitation measures to facilitate the recovery of burned areas.

The BLM may construct a boat launching site on the South Fork Owyhee River to provide boaters (rafts, kayaks, and canoes) better access to the river. This undertaking would also necessitate the improvement of the access road to the boat launching site. This project would likely increase the popularity of the area.

2.8 Summary Comparison and BLM's Preferred Alternative

For each of the allotments or allotment complex under consideration, a summary of the potential impacts as determined in the analysis in Chapter 3 is provided below. The tables provide a "side-by-side" comparison of the impacts and the text explains the general impacts. Details of the impacts are described in Chapter 3.

2.8.1 Sheep Allotment Complex

As indicated in Section 3.2.1, continuance of Alternative 1 would not allow BLM to meet the rangeland health standards; therefore, this alternative is for comparison purposes only. Potential long-term impacts to the plant communities and habitat for the subject sensitive species would occur under this alternative (**Table 2-42**). Impacts would be most pronounced for long-eared owl, short-eared owl, and sage grouse due to continued impacts to the riparian vegetation. Sage grouse would also be affected by impacts to the nesting habitat. Non-native species would continue to spread under this alternative, degrading the habitat for all species.

Alternative 2 would improve the overall plant health (shrubs and grasses), improving habitat for the raptor prey species and for sage grouse through changes in grazing management and wild horse numbers. The range improvements would improve riparian habitat, with concomitant benefits to long-eared owl, short-eared owl, and sage grouse. Other raptor species would also benefit by the improved riparian habitat as these areas would attract additional prey species.

The range improvements under this alternative could have some impact on sage grouse at riparian areas. Some mortality due to fence collisions is possible, but may not be measurable as a population level impact. This is likely to be offset by the improved foraging conditions for sage grouse broods at the protected riparian areas.

Alternative 3 would result in improvement of the upland vegetation, but impacts to riparian vegetation would show some improvement due to adjustments in wild horse numbers, but not to the extent of the improvement anticipated for Alternative 2. Similarly impacts from non-native, invasive species at riparian areas would continue at reduced levels. The impacts to riparian areas would impact all the raptors, but especially the long-eared and short-eared owls. Sage grouse summer brood habitat would remain degraded under this alternative. It is likely that the rangeland health standards for the riparian/spring areas would not be met under this alternative.

Alternative 4 would result in improvement in the upland vegetation at least to the extent of the improvement anticipated under Alternative 2 or even greater due to the elimination of the growing season livestock grazing. Benefits to the raptor prey species are likely to be realized. Short-eared owl, long-eared owl, and sage grouse would benefit from improved riparian areas, as would the other raptors, but not to the same extent.

Table 2 - 42: Sheep Allotment Complex - Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permitted Use (AUMs)	39,000	26,652	26,652	25,647
Change (AUMs)	None	-12,348 or -32%	-12,348 or -32%	-13,353 or -34%
Avg. Actual Use (AUMs)	17,573	n/a	n/a	n/a
Resource				
Vegetation	Long term decline in shrub vigor near concentration areas; long-term grass vigor in spring use areas	Improved upland shrub and grass health and vigor. Some areas of impact.	Improved upland shrub and grass health and vigor. Some areas of impact.	Improved upland shrub and grass health and vigor. Some areas of impact. More improvement for grasses than Alternative 2.
Non-Native, Invasive Species	High potential for establishment and spread.	Lower potential for establishment and spread in the long-term.	Moderate potential for establishment and spread.	Lower potential for establishment and spread in the long-term.
Wetland/Riparian Zones	Long-term degradation.	Improvement of riparian vegetation.	Riparian would show modest improvement (wild horses).	Improvement of riparian vegetation.
Sensitive Species	Long-term degradation of habitat, esp. long-eared owl, short-eared owl, and sage grouse, and to a lesser extent, other raptors	Long-term improvement of long-eared and short-eared owl habitats; short-term improvement of sage grouse brood habitat; potential long-term impact to sage grouse brood habitat; improved sage grouse nesting habitat.	Long-term poor quality of habitat, esp. long-eared owl, short-eared owl, and sage grouse, and to a lesser extent, other raptors. Not to the magnitude of Alternative 1	Long-term improvement of long-eared and short-eared owl habitats; short-term improvement of sage grouse brood habitat; potential long-term impact to sage grouse brood habitat. Some potential for impacts to sage grouse nesting habitat.
Meet Rangeland Health Standards - Upland	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Riparian	No	Yes	No	Yes
Meet Rangeland Health Standards - Habitat	No	Yes	Yes	Yes

The range improvements under this alternative could have some impact on sage grouse at riparian areas. Some mortality due to fence collisions is possible, but may not be measurable as a population level impact. This is likely to be offset by the improved foraging conditions for sage grouse broods at the protected riparian areas.

The elimination of spring grazing under this alternative would result in a trade-off of grazing sage grouse winter, breeding, and nesting habitat during part of the breeding season (March). This would have potential impacts to sage grouse through either disruption of the breeding activity or removal of residual nesting cover.

The BLM preferred alternative for the Sheep Allotment Complex is Alternative 2 – Implement the Multiple Use Decision.

2.8.2 Big Springs Allotment

As indicated in Section 3.2.2, continuance of Alternative 1 would not allow BLM to meet the rangeland health standards; therefore, this alternative is for comparison purposes only. Potential long-term impacts to the plant communities and habitat for the subject sensitive species would occur under this alternative (**Table 2-42**). Impacts to riparian vegetation and sage grouse habitat would occur under this alternative as riparian areas would continue to receive heavy use and water developments would continue to divert most or all of the water from several springs. Under this alternative, the potential would remain high for non-native, invasive species establishment.

Alternative 2 would result in long-term improvement of shrub and grass species. Some short-term impacts may occur, but the rest built into the system between periods of use would allow the shrubs to recover and maintain vigor. Similarly, grasses would demonstrate some short-term impacts, but would receive rest to allow sufficient photosynthesis to maintain plant vigor. Some impacts would continue at the areas of concentrate used (i.e., water developments) as these areas receive heavier use than the rest of the pastures in addition to the mechanical hoof disturbance. These areas would be smaller in size, but more numerous as the new water sources would increase distribution of livestock grazing (decreasing the size of the area of impact in comparison to Alternative 1), but there would be more sites.

The improvement in upland vegetation and riparian areas would decrease the long-term potential for non-native, invasive species establishment However, the construction of the pipelines, fences, and seedings would create short-term potential for these species to establish within the allotment through surface disturbance that creates suitable seedbeds for non-native, invasive species. The net result would be lower overall potential for non-native, invasive species.

The grazing system and spring exclosures/riparian fencing would improve riparian habitat as these areas would receive rest or protection during hot season grazing.

This alternative would improve nesting habitat quality, reduce disturbance at leks, and improve summer brood habitat for sage grouse. The seedings would eliminate approximately 5,000 acres of winter habitat for the short-term. Long-term impacts would depend on the seed mixture used.

Alternative 3 would achieve the riparian goals without the riparian exclosures/fences and seedings, by creating riparian pastures in which the grazing is designed to benefit the riparian vegetation. The grazing system would result in improved upland grass and shrub vigor by providing sufficient rest between grazing periods in all pastures. The impact to grasses from the sagebrush density combined with the grazing near the water sources cannot be alleviated by only a change in the grazing system.

The potential for non-native, invasive species to establish is less under this alternative than for Alternative 1 and Alternative 2. Fewer acres of

Table 2 - 43: Big Springs Allotment - Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permitted Use (AUMs)	21,983	16,963	15,808	14,472
Change (AUMs)	None	-5,000 or -23%	-6,175 or -28%	-7,511 or -34%
Avg. Actual Use (AUMs)	10,500	n/a	n/a	n/a
Resource				
Vegetation	Long term decline in shrub vigor near concentration areas; long-term decline in grass vigor in spring use areas.	Improved upland shrub and grass health and vigor. Some areas of impact.	Improved upland shrub and grass health and vigor. Some areas of impact.	Improved upland shrub and grass health and vigor. Some areas of continued impact. Potential for some change in plant species composition.
Non-Native, Invasive Species	High potential for establishment and spread.	Lower potential for establishment and spread in the long-term.	Moderate potential for establishment and spread.	Low to moderate potential for establishment and spread.
Wetland/Riparian Zones	Long-term degradation	Improvement of riparian vegetation.	Improvement of riparian vegetation, but not to extent of Alternative 2	Improvement of riparian vegetation greater than Alternative 3, but not as great as Alternative 2.
Sensitive Species	Long-term impacts to sage grouse nesting and brood habitat; lek disturbance.	Improvement of sage grouse nesting and brood habitat; reduction of disturbance at leks; potential for loss of some winter habitat. Seedings have mixed benefits/impacts to sage grouse	Improvement of sage grouse nesting and some brood habitat; but also potential for impacts to brood habitat and some nesting habitat. Seedings have mixed benefits/impacts to sage grouse.	Improvement of sage grouse nesting and some brood habitat; but also potential for impacts to brood habitat and some nesting habitat. Seedings have mixed benefits/impacts to sage grouse.
Meet Rangeland Health Standards - Upland	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Riparian	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Habitat	No	Yes	Yes	Yes

surface disturbance would occur due to the elimination of seedings and some of the fences. The riparian vegetation would also recover under this alternative, except where wild horses are the causal factor. The grazing system would provide deferred use or rest-rotation in all the pastures with riparian habitats. However, livestock would still have access to the riparian areas and the amount of improvement under this alternative is anticipated to be less than Alternative 2.

This alternative would result in the improvement of some nesting habitat, but without the rehabilitation of the sagebrush in Holborn Pasture, the potential for nesting habitat in this area of degraded sagebrush would not be realized. Summer brood habitat would not improve to the same extent as under Alternative 2. Lek disturbance would be reduced, and the proposed seedings would replace annual vegetation with perennial vegetation. The seed mixture would determine the overall impact to sage grouse from these seedings.

Alternative 4 would result in improvement of the grass and shrub vigor. The rest or deferment of riparian vegetation as well as the upland vegetation, combined with reduced AUMs would provide for lower intensity of use and periods of rest for plants to recover from the effects of herbivory. However, the grazing system repeats itself in several pastures each year, increasing the potential for some selective grazing pressure to alter the species composition in the long-term.

Only two spring exclosures would be constructed under this alternative. The riparian improvement would be primarily a result of the grazing system. This is anticipated in provide more improvement in riparian vegetation than Alternative 3, but not as much as Alternative 2.

Impacts from non-native, invasive species would be similar to Alternative 3.

Sage grouse would benefit from this alternative due to improved nesting habitat and some improvement in summer brood habitat. Impacts from the seedings would be similar to Alternative 2.

The BLM preferred alternative for the Big Springs Allotment is Alternative 2 – Implement the Multiple Use Decision.

2.8.3 Owyhee Allotment

As indicated in Section 3.4.1.2, the upland areas were improving under the existing grazing system, but the riparian rangeland health objectives were not being met (**Table 2-44**). Therefore, this alternative is for comparison purposes only. Impacts to sage grouse breeding and nesting activities are likely to occur under this alternative due to the alternating early season use in Star Ridge and Dry Creek pastures where 11 of the 12 leks within the allotment are located. The impacts to the riparian vegetation under this alternative reduce the quality of habitat for the long-eared owl, short-eared owl, and sage grouse brood habitat. Habitat for many of the prey species on which the raptors depend would also be degraded under this alternative.

Non-native, invasive species would continue to occupy and spread within the riparian areas under this alternative.

Alternative 2 would address many of the riparian issues, improving brood habitat for sage grouse, and habitat for long-eared and short-eared owls. An increase in prey species and abundance in the riparian areas is also anticipated under this alternative. The use of Star Ridge and Dry Creek pastures would still rotate between rest and use during the breeding/nesting season for sage grouse. Disturbance at the leks could occur under this alternative. Removal of residual grass cover in nesting habitat could also occur.

The range improvements would have an overall benefit to sage grouse, although some mortality due to fence collisions could occur. The proposed vegetation treatments would open the dense sagebrush canopy and provide for a diversity of forbs and grasses. This is likely to improve habitat

Table 2 - 44: Owyhee Allotment - Comparison of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Permitted Use (AUMs)	30,155	29,903	27,837	20,706
Change (AUMs)	None	-52 or -1%	-2,318 or -8%	-9,449 or -31%
Avg. Actual Use (AUMs)				
Resource				
Vegetation	Improvement in upland vegetation. Impacts at areas of livestock concentration.	Improved upland shrub and grass health and vigor. Some areas of impact.	Improved upland shrub and grass health and vigor. Some areas of impact.	Improved upland shrub and grass health and vigor. Some areas of continued impact.
Non-Native, Invasive Species	Moderate potential for establishment and spread.	Lower potential for establishment and spread in the long-term.	Moderate potential for establishment and spread.	Low to moderate potential for establishment and spread.
Wetland/Riparian Zones	Long-term degradation	Improvement of riparian vegetation.	Improvement of riparian vegetation, but not to extent of Alternative 2 (i.e., Bookkeeper Spring)	Improvement of riparian vegetation greater than Alternative 3, but over a longer period as compared to Alternative 2.
Sensitive Species	Degradation of sage-grouse brood habitat; potential impacts to nesting habitat; disturbance at leks. Degradation of habitat for long-eared owl and short-eared owl; degradation of prey habitat for raptors.	Improvement of sage grouse nesting and brood habitat; reduction of disturbance at leks. Improvement of burrowing owl, long-eared owl, and short-eared owl habitat; improvement of raptor prey habitat.	Improvement of some sage grouse brood habitat; but also potential for impacts to brood habitat and some nesting habitat; reduction of disturbance at leks. Improvement of long-eared owl and short-eared owl habitat; improvement of raptor prey habitat.	Improvement of sage grouse nesting and brood habitat; reduction of disturbance at leks. Improvement of burrowing owl, long-eared owl, and short-eared owl habitat; improvement of raptor prey habitat.
Meet Rangeland Health Standards - Upland	Yes	Yes	Yes	Yes
Meet Rangeland Health Standards - Riparian	No	Yes	Yes	Yes
Meet Rangeland Health Standards - Habitat	No	Yes	Yes	Yes

for prey species, as well as provide forbs for sage grouse broods. The openings may also be used as leks by sage grouse and nesting areas by burrowing owls, and possibly by short-eared owls.

Construction of the range improvements has potential to increase the distribution of non-native, invasive species under this alternative.

Alternative 3 would eliminate the disturbance at leks in Dry Creek Pasture by changing the livestock use to summer and fall or summer use. Star Ridge Pasture would alternate between rest and spring use, continuing the potential to disturb leks and remove nesting residual cover.

Recovery of riparian habitat in Upper and Lower Fourmile pastures and Chimney Creek Pasture would improve sage grouse brood habitat and habitat for long-eared and short-eared owls. Bookkeeper Spring would continue to be impacted by wild horses under this alternative.

The vegetation treatments would not be conducted under this alternative and the improved habitat for sage grouse, burrowing owl, and short-eared owls would not be realized. Similarly, the potential increase in prey species and abundance associated with these treatments would not occur.

Alternative 4 would also result in improvement of the riparian habitat, with concomitant benefits to sage grouse, long-eared owl, and short-eared owl, as well as the prey species for other raptors. The summer use alternating with rest in Dry Creek would eliminate disturbance at leks and provide residual nest cover in this pasture. Impacts to sage grouse (disturbance at leks and removal of residual nesting cover) would continue in the Star Ridge pasture.

The proposed vegetation treatments would open the dense sagebrush canopy and provide for a diversity of forbs and grasses. This is likely to improve habitat for prey species, as well as provide forbs for sage grouse broods. The openings may also be used as leks by sage grouse and nesting areas by burrowing owls, and possibly by short-eared owls. This is likely to improve habitat for prey species.

The BLM preferred alternative for the Owyhee Allotment is Alternative 2 – Implement the Multiple Use Decision.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter provides a description of the existing condition of the environment (i.e., affected environment) as the base for determining potential impacts (i.e., environmental consequences) from the implementation of the Alternatives. The baseline information was obtained from the allotment evaluations and BLM and NDOW files and includes the Sheep Allotment Complex (**Map 2-1**), Big Springs Allotment (**Map 2-6**), and Owyhee Allotment (**Map 2-11**). The geographic area considered for analysis was based on previous NEPA analysis and the scoping process. For each of the resources analyzed, the area of affected environment was defined by the area of potential environmental impacts due to the alternatives. This was generally considered the area within the allotment boundaries.

For each resource, the regulatory framework governing the resource use, protection, or management has been provided in **Appendix B**. These laws, regulations, and policies set the limits for impacts or set the conditions under which certain activities may take place. The context of these laws, regulations, and policies guide the analysis.

The analysis of impacts assumes that the environmental protection measures or standard operating procedures described in Chapter 2 that are common to all alternatives (Section 2.2) would be implemented. These measures were included in the alternatives in order to reduce potential impacts or to comply with laws or stipulations of permits or land use plans. The impacts are generally described as direct (i.e., caused by the action and occur at the same time and place), or indirect (i.e., caused by the action and are later in time and farther removed in distance, but are still reasonably foreseeable). Impacts characterized as short-term generally would occur over one grazing cycle, and long-term impacts would occur over several grazing cycles. Where adverse impacts have been identified, mitigation measures are recommended. These measures are not part of the alternatives, but may be committed to by the BLM when issuing its decision to implement the selected alternative. Residual impacts are those impacts that would remain following implementation of the mitigation measures.

An analysis of cumulative impacts concludes the analysis of existing conditions and effects of the alternatives for the Sheep Allotment Complex, Big Springs, and Owyhee allotments.

3.1.1 Setting

The sensitive species designation is normally used for species that occur on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. BLM policy is to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed as threatened or endangered under the Endangered Species Act. Greater sage grouse occur throughout the Elko District, and are known to use habitat found in the Sheep Complex Allotments, Big Springs Allotment and Owyhee Allotment. BLM-sensitive raptors that are the focus of this EIS are:

Golden Eagle

Northern Goshawk

Ferruginous Hawk

Swainson's Hawk

American Peregrine Falcon

Prairie Falcon

Burrowing Owl

Long-eared Owl

Short-eared Owl

Flammulated Owl[4]

3.1.1.1 Sheep Allotment Complex

The Sheep Allotment Complex consists of nine allotments located in southeastern Elko County (**Map 2-2**). The Sheep Allotment Complex is non-contiguous, with Boone Springs Allotment discontinuous from the other allotments in the complex. The crest of the Goshute Mountains forms the area's western boundary, while the eastern boundary is the Utah state line and the Kingsley Mountains. The southern boundary of the complex area is the Elko/White Pine county lines, and the northern boundary is Interstate 80 and the Dolly Varden Mountains. Elevations within the complex range from 4,300 feet near Wendover, to approximately 9,610 feet on top of the Goshute Mountains. Large portions of the Antelope Valley and Goshute HMAs are in the complex, and managed to sustain viable wild horse populations. The Bluebell and Goshute Peak WSAs are also located in the higher elevations of the complex. The Salt Lake ACEC, as delineated in the Wells RMP, was identified as historical peregrine falcon use area which supported a population of nesting falcons up until 1960.

3.1.1.2 Big Springs Allotment

The Big Springs Allotment is bounded on the east by the crest of the Toano/Goshute Mountains and on the west by the crest of the Wood Hills (**Map 2-3**). The Pequop Mountains run north-south through the middle of the allotment. This allotment encompasses the northern portions of the Independence and Steptoe/Goshute valleys, and spans 39 miles north-to-south, and 30 miles east-to-west. The West and East Big Springs allotments vary in elevation from 5,582 feet in northern Steptoe Valley to 9,249 feet atop the South Pequop Mountains. The Bluebell WSA and portions of the Spruce-Pequop HMA are located in the West and East Big Springs allotments.

There are five wells and springs that are the municipal water sources for the city of West Wendover, Nevada. A Source Water Protection Zone has been designated to include the water sources associated with the Big Springs Ranch and the well heads south of the Shafter interchange of Interstate 80. Each water source has a delineated water quality protection zone on public lands. Several large springs occur within the allotment on private lands.

3.1.1.3 Owyhee Allotment

The South Fork Owyhee River forms the northwestern boundary of the Owyhee Allotment. The remaining boundaries are established by allotment boundary fences. The allotment is divided into four native pastures and one seeded pasture. Private lands associated with Fourmile and Winters creeks are fenced separately from the public lands in the allotment.

The allotment is characterized by a high rolling plateau underlain by basalt flows which are occasionally cut by deep, vertically walled canyons. Elevation ranges from 5,100 to 5,600 feet. There are two WSAs within the allotment: the Owyhee Canyon and South Fork Owyhee WSAs.

3.1.2 Critical Elements Not Present, Not Affected, or Previously Analyzed

3.1.2.1 Critical Elements Not Present or Not Affected

Prior to issuing the three MUDs, all critical elements of the human environment were evaluated to determine if significant impacts would result from the implementation of the MUDs, such that preparation of an EIS would be required. As a result, BLM specialists determined that the following critical elements are not present or would not be affected:

- Air Quality;
- Farm Lands (Prime or Unique)

[4] Flammulated owl occurs on the Sheep Allotment Complex. It is the only BLM-Sensitive Raptor that does not occur on both the Owyhee Allotment and Sheep Allotment Complex.

- Environmental Justice
- Hazardous or Solid Wastes
- Floodplains.

3.1.2.2 Critical Elements Previously Analyzed

This EIS tiers to analyses from the EISs for the Elko and Wells RMPs, and more specific analyses from the environmental assessments for the Big Springs MUD ((BLM/EK/PL-2002/029) and the Owyhee MUD (BLM/EK/PL-2002/001) are incorporated by reference. As part of completing scoping for this EIS, BLM reviewed critical elements that could be affected by the proposed grazing and other management decisions as described by Alternative 2 in this EIS, and concluded that no significant impact would result. Therefore, impacts to cultural resources, Native American concerns, water quality and threatened or endangered species were not considered as significant issues for detailed analysis in this EIS.

Cultural Resources

Changes to grazing patterns from use permitted under alternatives 1 and 2, are not anticipated to create any additional disturbance to cultural resources beyond levels that have occurred from historic grazing throughout the allotments. Impacts to significant cultural resources may occur as a result of implementing projects proposed under Alternative 2 that lead to earth-disturbing activities, such as seedings, fence construction, and livestock, wildlife and wild horse water developments. As a standard operating procedure, BLM completes cultural resource surveys as projects are designed. Significant cultural resources are either avoided or mitigated. Mitigation measures agreed in consultation with the State Historic Preservation Officer (SHPO), under procedures detailed under Section 106 of the National Historic Preservation Act, BLM's 4th edition of "Cultural Resources Inventory General Guidelines" of 1989. and the State Protocol Agreement between the Nevada BLM and the SHPO. Thus, projects proposed by the MUDs as part of Alternative 2 are not expected to result in significant adverse impacts to cultural resources.

Because alternatives 3 and 4 involve construction of less or no ground disturbing activities, the likelihood of their adversely affecting a significant cultural resource is less than Alternative 2.

Native American Religious Concerns

The Elko District is located within the traditional territory of the Western Shoshone, and contains spiritual, traditional and cultural resources, sites, and social practices that aid in maintaining and strengthening social, cultural, and spiritual integrity of importance to tribes. Tribes have expressed interest in commenting on specific project proposals and BLM would initiate consultation as projects are planned. BLM, through informal or early communication and coordination, has identified to the Tribes the schedule for the allotment evaluations each year. BLM is aware of the importance of water sources and the sensitive bird species to traditional lifeways. Water sources and animals are considered the "life blood of the Earth and all who dwell upon it;" and those animal species associated with creation stories, spiritual guidance, healing (medicine), and cultural affiliation are of concern. Avian species such as owls, eagles and other raptors, and sage grouse have been recognized by not only the Western Shoshone, but many other tribes across the United States as being sacred animals and a vital component in the maintenance of traditional beliefs and spiritual integrity. The proposed changes to grazing management under each of the action alternatives are generally expected to lead to healthier habitat for sage grouse raptors, and so will likely be beneficial to Native American traditional lifeways. If the water developments proposed by Alternative 2 are not constructed under Alternatives 3 or 4, less protection of water sources would be expected. Any improvement in the condition of water sources may benefit tribal use of sites of cultural, traditional, spiritual importance, as is improvement in the condition of upland habitat of importance to Native Americans.

Migratory Birds

The environmental assessment for the Big Springs and Owyhee MUDs included a listing of the migratory bird species associated with each of the ecotypes from the 1999 Nevada Partners in Flight Bird Conservation Plan, along with an analysis of impacts associated with the No Action and Proposed Action alternatives (i.e., Alternatives 1 and 2). They conclude that impacts to migratory birds are expected to be minimal. Making progress towards meeting the rangeland health standards is expected to improve habitat used by migratory birds, and incorporate conservation measures listed in the Migratory Bird Executive Order. To the extent that projects proposed under Alternatives 2, 3, and 4 include incorporation of design features to mitigate adverse effects as well as measures to conserve the sensitive bird species, implementation of Alternatives 2, 3, or 4 is not expected to have any measurable effect on migratory bird populations.

Threatened and Endangered Species

The only species listed under the Endangered Species Act that occurs in the allotments is the threatened bald eagle. Bald eagles have been seen throughout northeastern Nevada during the winter months and are an uncommon spring/fall migrant. Continued grazing of livestock under each of the action alternatives is not expected to have any adverse effect on bald eagles. Implementation of the action alternatives is expected to result in improved habitat conditions and increased prey base for bald eagles.

Water Quality Drinking/Ground and Soil

Water quality and soil conditions would improve at the seven springs that would be protected by exclosures in the Sheep Allotment Complex under Alternatives 2 and 4. There would be neither livestock use nor hot season wild horse use of the riparian vegetation associated with these springs. The lentic areas associated with the springs exclosure projects would become functional which would stabilize soils, making soil particles less susceptible to detachment, reducing erosion. Turbidity and suspended solid levels should decrease, and without trampling and associated soil compaction. Under Alternative 3 (Grazing without Riparian Exclosures and Vegetation Treatments), impacts would be similar to those that are occurring with the no action alternative 1, but not as severe.

In the East Big Springs Allotment, the Source Water Area Protection Zone surrounding the springs for West Wendover is located In the North of Home Pasture. This pasture has historically received variable periods and seasons of livestock use. Water quality at spring and seep areas would be deteriorated from concentrated livestock use. Soil compaction from trampling would occur in the riparian areas which would reduce infiltration and increase runoff. Lack of adequate vegetative cover would expose soils to wind and water erosion. Under Alternative 2, livestock use in the North of Home Pasture would generally be limited to trailing. There may also be some seasonal use of this pasture to accommodate livestock movement when the utilization objectives are met. This would limit livestock use in the watershed above the municipal water source springs for the City of West Wendover. Good watershed condition would help trap sediment and pollutants, allow for proper infiltration rates. Reducing the amount of time that livestock congregate around springs and streams would decrease sedimentation and the amount of fecal coliform in the water. Water quality would also be better protected by the grazing proposed for the North of Home Pasture proposed under Alternatives 3 and 4. Benefits of the riparian exclosures would not occur if they are not constructed under Alternative 3.

In the Owyhee Allotment, improved vegetative cover along the South Fork Owyhee River is expected to result from the proposed changes in grazing proposed by all of the alternatives along the South Fork Owyhee River. The stream temperature standard is not being met currently, and the improvement in stream shading would make progress toward meeting this water quality standard wherever other factors such as the geology and orientation of the river preclude this. Improved vegetative cover along the river would

trap more sediment and stabilize stream banks, resulting in improved water quality. Improved vegetative cover along the South Fork Owyhee River would also improve floodplain function by dissipating stream energy, filtering sediment, and maintaining the water table.

To the extent applicable to this evaluation of the impacts of grazing to the sensitive bird species that is the focus of this EIS, previously analyzed impacts to other critical elements are referenced where pertinent. This includes impacts to the following special management areas established by the Wells and Elko RMPs:

- Wilderness Study Areas (as they occur in Sheep Allotment Complex, Big Springs, and Owyhee allotments;
- Wild and Scenic Rivers (in the Owyhee Allotment); and
- Salt Lake ACEC (in the Sheep Allotment Complex).

The analyses for these elements are integrated within the detailed analyses for the significant issues that are analyzed in detail in this chapter:

- Vegetation resources (including non-native, invasive species);
- Wetlands and riparian zones; and
- Avian sensitive species (sage grouse and raptors as specified by the court order).

However, as per the Minute Order, the EIS is to analyze: "*To the extent applicable to these sensitive species the BLM shall evaluate the impacts of grazing, considering springs, seeps and riparian areas, uplands habitat and land use plans*." Therefore, these resources as they relate to habitat for the avian sensitive species or to the habitat for their prey species, are the focus of the EIS.

3.1.2.3 Assessment Methodology

Based on the elements previously analyzed and the judges order, it was determined that impacts to the subject sensitive species could be assessed through evaluation of the alternatives with respect to the habitat components – vegetation (including non-native, invasive species) and wetland/riparian zones, and with respect to the subject sensitive species and the habitat for the prey species on which the raptors depend.

The alternatives consist of two general actions: grazing management and range improvements. These components were evaluated with respect to the vegetation, non-native, invasive species, wetland/riparian areas, and the subject sensitive species as described below.

3.1.2.3.1 Vegetation

There are three major types of effects to vegetation that have potential to occur from the various alternatives. The first type of effect is that of changes to plant productivity and survival due to herbivory[5].

The second is the effect of the range improvements on the plants and plant communities. The effect of the range improvements focuses on the physical impact to vegetation from constructing the range improvement, as well as the longer-term potential impact from the establishment of non-native, invasive species, concentration of livestock, and distribution of the grazing effort.

The third effect is the potential for non-native, invasive species to establish and spread as a result of the grazing systems. This is primarily a function of surface disturbance, changes in plant communities, and transportation of seeds.

[5] Herbivory is the general term for removal of plant material by animals. This can include large grazers/browsers, such as livestock or elk, small mammals, such as rabbits and ground squirrels, and plant eating insects.

Plant Productivity

The effect of herbivory on plants is a function of time, duration, and intensity (Bedunah and Sosebee 1995). Time refers to the annual plant life cycle and when herbivory takes place (i.e., during the growing season or during dormancy). Duration is the length of time over which the herbivory occurs. Intensity is a measure of the amount of plant material removed by herbivory and is normally separated by current year's growth and previous years' growth.

Time of Herbivory – Shrubs

Most plants initiate growth in the spring when soil temperatures reach approximately 40^{o} to 42^{o} F (Dietz 1989). Growth is initially fueled by carbohydrates stored within above ground plant parts until leaves are sufficiently developed to conduct photosynthesis. The previous year's growth has buds that develop into leaves as well as terminal and lateral buds that develop into new branches or leaders. As the leaders grow, they produce new leaves and may branch to produce lateral branches. At the end of the growing season, the current year's growth "hardens" as the plant transitions into the dormant[6] period. The terminal and lateral buds produced during the growing season are the new growing points for the next year. The various woody sagebrush species, bitterbrush, and winterfat are somewhat of an exception to this general growth pattern because these species maintain some leaves throughout the "dormant" period and produce seed and conduct photosynthesis during the late fall and winter when conditions are suitable. The presence of mature leaves in spring provides these species with a competitive advantage over other deciduous shrubs because they are able to rely less on stored reserves and more on photosynthetic products in the winter/spring to initiate new growth. This characteristic also allows established sagebrush, bitterbrush, and winterfat plants to take advantage of winter moisture.

Herbivory in the spring removes the new growth on a branch, requiring additional energy to re-initiate new growth. The bud elongates from the base, with the bud remaining at the end of the shoot or leader. The removal of the end of the leader removes the bud. Depending on how much of the new growth is removed, some or all of the growing points on the new growth may be removed, thus there may be a delay in the regrowth as the plant must develop new growing points. Removal of the new growth delays or reduces the photosynthetic activity, which then limits the amount of carbohydrates available for root growth.

Herbivory in the summer, during the growing season, also removes current year's growth, but the volume of available current growth is greater than in early spring. By mid to late summer photosynthesis has been ongoing, providing the energy for leader and leaf growth, providing carbohydrates for root growth, and replacing carbohydrate reserves used earlier in the spring. The removal of the current growth during this time period is likely to remove either flowering parts, or new buds, and therefore, have some effect on the overall reproductive capability of the plant.

The plants go into dormancy from late summer through fall (depending on the plant species). Herbivory during late summer, fall, and winter removes the growing points for the coming year, but does not substantially affect the plant energy reserves. As indicated above, the woody sagebrush species are somewhat of an exception to this general pattern. The sagebrush species conduct limited photosynthesis during winter and increase the rate of photosynthetic activity as the temperatures increase in late winter/spring.

Duration and Intensity of Herbivory – Shrubs

Intensity of herbivory is a function of the length of time (duration) a plant is exposed to herbivores, the number of herbivores, and the choices available to the herbivores. The more time herbivores are in an area, the higher the

[6] There is no real dormant season. During late summer and winter respiration continues, albeit at a greatly reduced rate. However, the respiration during this time uses root reserves and there is no active growth.

probability that a plant is browsed and the higher the probability that the plant receives repeat browsing. Similarly, the more herbivores present over a given period of time increase the probability that a plant is browsed one or more times. The probabilities increase further if the choice of plants is low (i.e., only a few plant species available).

Animal behavior is also a factor in determining intensity of herbivory. Animals that constantly move generally remove less plant material per plant than animals that are sedentary and browse repeatedly on the same plants (Norton and Johnson 1983).

Intensity is measured by the volume or percentage of new leaders browsed and the amount or percentage of the leader removed. The higher the intensity of herbivory, the greater the effect on the plant, in both the short-term and long-term (Bilbrough and Richards 1993). As more leaders are removed, and as a higher percentage of each leader is removed, the ability of the plant to generate sufficient photosynthetic product (i.e., carbohydrates) to initiate growth the next year or to promote root growth during the current year, is reduced. The plant's ability to develop growing points for the next year or seed during the current year also result in stress to the plant. The stress is reflected by less vigorous growth and inability to compete with neighboring plants that have not been browsed. High levels of herbivory remove growing points and require the plant to devote more energy to maintenance than to growth, reproduction, or replacing energy reserves.

The below-ground plant biomass must be sufficient to supply the above-ground biomass with energy, nutrients, and water, and the above-ground biomass must be sufficient to provide carbohydrates for root growth and replacement. High intensity herbivory reduces the above-ground biomass, which reduces the amount of photosynthetic product the plant can produce. Root growth is simultaneously reduced, so the plant has access to less soil moisture and soil nutrients than a plant with normal root growth, with concomitant less capacity for photosynthetic activity. This limits the ability of the plant to take advantage of spring growing conditions, and the above ground productivity is reduced the following spring.

When previous years' branches are removed, no current year's growing points are available, and the plant is required to develop new growing points on the woody branches. The result is fewer and shorter leaders (i.e., less forage), which reduces the plant's ability to compete due to reduced photosynthetic activity and reduced energy reserves.

Time of Herbivory – Grasses

The general growth pattern in perennial grasses is not unlike the growth pattern described for shrubs, except the growing period for grasses is generally shorter than the growth period for shrubs due to moisture limitations in the summer. However, the location of the growth points is different than the location in shrubs. Grasses are also classified as cool season and warm season depending on when they initiate growth and the time of year when they are actively growing. Cool season grasses initiate growth in the spring when soil temperature reaches 40^{o} to 45^{o} F and complete their growth cycle in mid-summer. Cool season grasses have greatly reduced growth or are "dormant" during the hot summer months, which is followed by a period of fall green up or increased respiration (varies among species), when temperatures cool and soil moisture increases. Growth at this time is not always represented by leaf material, but development of new growing points, initial development of tillers (above-ground plant parts), and carbohydrate storage may occur.

Warm season grasses initiate growth when soil temperatures reach 60^{o} to 65^{o} F (Dietz 1989) and are actively growing during the warm summer months. These grasses generally are dormant during the winter, having developed the new growing points by summer's end.

Grasses initiate growth from dormant buds, and as the tillers develop, continue growing from growing points on the tillers (Jewiss 1972). The growing points are located in the plant crown[7] close to the ground during early spring and increase in height as the tiller height increases. Herbivory that occurs above the growing point removes biomass and reduces photosynthetic capacity for the short-term (i.e., days). This removal of photosynthetic tissue results in less carbohydrates going to the roots, and carbohydrates from above-ground reserves used for new growth (Briske and Richards 1995). The tiller resumes growth and the carbohydrates produced are used to support additional growth and respiration for above ground parts and roots. Carbohydrates that are produced in excess of the immediate needs for energy are pooled in plant crowns and the root system.

Herbivory below the growing points requires that dormant buds at the plant base be activated to resume growth. The grazed tiller does not regrow, but is replaced by a new tiller, which requires more carbohydrates than is required for tiller regrowth. Dormant bud initiation drains the carbohydrate reserves and result in a longer delay in restoring photosynthesis. This reduces the amount of root growth and root replacement for the plant, which can result in a loss of vigor and reduced root mass, especially when repeated grazing throughout the growing season continuously removes active growing points.

As with the shrubs, reduced root mass results in less growth the following year, which results in even less root mass. In grasses, approximately 30 percent of the root is lost and replaced each year. Stressed plants lose the 30 percent, but do not replace all of the lost root biomass, which decreases the plant's vigor and its ability to produce new growth the following year. Conversely, the greater the root mass and carbohydrate reserves, the greater the number of dormant buds produced and the potential is greater for more plant above-ground biomass and growth the following growing season.

For cool season grasses, such as bluebunch wheatgrass, the plants are dormant or very slow growing during the late summer. However, during the cool fall weather, these cool season grasses resume plant growth, by resuming tiller growth and/or creating new buds. This fall growth is responsible for replenishing the carbohydrate reserves, up to 80 percent of the energy required to initiate growth the following growing season in some grass species.

For warm season grasses, such as alkali sacaton and inland saltgrass, the growth cycle is that of early summer initiation of growth which continues into late summer, followed by the onset of dormancy. No fall regrowth occurs and the root development takes place during the active growing season. Carbohydrates reserves must be replenished during the summer growth period.

Consequently, the time factor with respect to herbivory of grasses is related to the location of the growth points and the season of use. During early spring grazing, the growth points (apical meristems) are located near the ground and are not likely to be removed by grazing. During late spring and summer grazing of cool season grasses, the growth points are well above the ground[8] and the potential for removal is greater. During late summer, the cool season grasses are dormant and grazing does not substantially affect the plant. However, the fall green-up period is an important time for energy storage and grazing below the growing points at this time of the growth cycle can affect carbohydrate production and storage. For warm season grasses the growth period is short, and grazing below the growing points during the summer period reduces the plant's vigor.

[7] The plant crown or root collar is the portion of the grass plant immediately above the roots. This portion of the plant contains the meristematic tissues, or the zone of cellular division. The root collar is also one area of carbohydrate storage (Richards and Caldwell 1985).

[8] The elevated growing points, or intercalary meristems, are located at the base of the leaf blade where the blade emerges from the sheath.

Duration and Intensity of Herbivory – Grasses

As with the shrubs, intensity is the measure of the amount of above-ground plant biomass removed. However, the amount of above-ground biomass is not as important as to whether or not the growing points are removed. For example, removing 60 percent of the above-ground biomass in early spring is not likely to remove the growing points that are close to the ground. However, removing 60 percent of the above-ground biomass in late spring may be sufficient to remove the growing points. The impacts to the plant from these two scenarios would be very different.

It is also important to note the "uniformity" of the grazing on a given plant. Removing 70 percent of the above-ground biomass by grazing the plant to a uniform height is different than removing 70 percent of the above-ground biomass by grazing one side of the plant. In the first case, the growing points are likely to be removed and the plant would be stressed. In the second case, a portion of the plant would continue to grow unaffected and would be able to continue photosynthesis to provide energy for regrowth and/or activate dormant buds on the portion of the plant removed below the active growing points. Although this is a measure of intensity of herbivory, it is also a function of the duration that the plant is exposed to herbivores and the number of herbivores. In a short exposure, herbivores are more likely to take one bite and move on (i.e., remove one side of the plant or the entire upper portion). In a long exposure, the herbivore is likely to return to the plant and remove the remaining herbage (Norton and Johnson 1983). Similarly, with fewer animals, fewer bites are taken, and with more animals, the probability is greater that the entire plant would be grazed.

Summary

The previous discussion provides a "yardstick" for comparing the various alternatives with respect to time, duration, and intensity of the herbivory. Each of the alternatives can be analyzed with respect to the ability to maintain adequate carbohydrate reserves and plant vigor by:

1. Keeping early defoliation periods short, or delaying initial defoliation;
2. Ensuring adequate leaf area and woody stems remain at the conclusion of a grazing period;
3. Providing adequate time between defoliation events to permit leaf area and carbohydrate reserves to build; and
4. Ensuring adequate residual leaf area and time late in the growing season to permit carbohydrate build-up and bud development.

3.1.2.3.2 Wetland/Riparian Zones

Although riparian vegetation grows where soil moisture is greater and available longer into the growing season than the upland range sites, the effects of herbivory to these plants are similar to the effects on upland plants. However, a substantial difference is the time available for regrowth due to the presence of soil moisture and nutrients. Overall, effects of herbivory are less when moisture and nutrients are readily available to the plant, as compared to the drier upland sites (Richards and Caldwell 1985).

As described above for vegetation, the first type of effect is that of changes to plant productivity and survival due to herbivory. The second is the effect of the range improvements on the riparian plants and plant communities due to the physical impact to vegetation of constructing the range improvement, as well as the longer-term potential impact from the establishment of non-native, invasive species, concentration of livestock, and distribution of the grazing effort.

Therefore, the analysis of the wetland/riparian zones is similar with respect to herbivory and range improvements as described above for the upland vegetation. However, at the wetlands and springs, there is the potential for additional impacts from soil compaction and removal of the water from the spring to the water

developments/troughs. The alternatives are also evaluated with respect to these potential impacts.

3.1.2.3.3 Avian Sensitive Species

Population data for raptors on the Sheep Allotment Complex, Big Springs, and Owyhee allotments is not available. Although Hawkwatch International conducts migratory counts of raptors in the Goshute Mountains each year, which provides trend data, the trend is for the western portion of North America. There is no specific information on the raptor population trend for the individual allotments. The regional trends cannot be linked to the actions on the allotments due to the many factors that may affect raptors that breed and nest in various parts of North America and may winter in southern United States or Central and South America.

Therefore, the approach taken to assess the potential impacts from the various alternatives on the subject sensitive species was to first determine if the livestock grazing had any direct impact on the sensitive species. Indirect impacts through alteration of habitat for the sensitive species or through alteration of prey species habitat were considered next. The impacts to habitat were assessed through the analysis conducted for the vegetation, non-native, invasive species, and riparian areas discussed above. Other indirect impacts, such as disturbance (i.e., presence of the livestock or the sheep herder), were assessed with respect to seasonal activities of the sensitive species (e.g., breeding or nesting).

3.2 Sheep Allotment Complex

3.2.1 Vegetation Resources (Including Non-Native, Invasive Species)

3.2.1.1 Affected Environment

The regulatory framework with respect to vegetation and non-native, invasive species is provided in **Appendix B**.

The lower valleys are dominated by the salt desert shrub community and receive minimal precipitation throughout the year. The salt desert shrub community transitions to a sagebrush community on the benches and foothills. Depending on the soil type, the community may be a big sagebrush-bunchgrass or low sagebrush-bunchgrass, or black sagebrush-bunchgrass community. The big sagebrush-bunchgrass community occurs on the deeper, well-drained soils and Wyoming big sagebrush is the dominant shrubs; the low sagebrush-bunchgrass community occurs on soils that have a claypan layer within 18 inches of the surface; and the black sagebrush-bunchgrass community occurs on calcareous soils with a duripan layer within 18 inches of the surface. As the elevation and corresponding precipitation increase, the big sagebrush type transitions to mountain big sagebrush and other mountain shrubs, such as bitterbrush and snowberry, may be associated with the sagebrush community. The two low-growing sagebrush communities (low sagebrush-bunchgrass and black sagebrush-bunchgrass) can be found intermixed with the mountain sagebrush community and at the ridge tops, depending on soil conditions. The pinyon-juniper community, consisting primarily of singleleaf pinyon and Utah juniper, is common on the benches, foothills, and sideslopes of the Goshute Mountains, Toano Range, and Kinsley Mountains. At the sideslopes and upper elevations of the Goshute Mountains and Toano Range, white fir, limber pine, bristlecone pine, Englemann spruce, and curleaf mountain mahogany are present. Pleistocene-relic populations of Rocky Mountain juniper, prostrate juniper, and cinquefoil are found on the west side of the Goshute Mountains. The riparian zones also support trees, such as alder, chokecherry, and willows, in some areas.

The BLM conducted a survey in 1998 for non-native, invasive species within the Sheep Allotment Complex and found the following noxious weeds:

- Houndstongue – UT/NV #1 Allotment – North Pasture;

- Saltcedar – UT/NV #1 Allotment – North Pasture (private lands);
- Canada thistle – Lead Hills Allotment;
- Hoary cress – Lead Hills Allotment (private lands);
- Squarose knapweed – Lead Hills Allotment.

In addition, cheatgrass, halogeton, several mustard species, and burr buttercup occur within most of the allotments.

3.2.1.2 Environmental Consequences

The Sheep Allotment Complex is used by sheep, wild horses, and wildlife. The wild horses and wildlife are present throughout the entire year, and sheep are present only during the late fall through early spring (November through March, April, or May, depending on the allotment). During the fall and winter, sheep are primarily browsers, feeding on shrubs and only a limited use of dry grasses. Winterfat (white sage), bitterbrush, mahogany, green molly, and rabbitbrush retain leaves throughout the winter. In the spring, sheep transition from browse to herbaceous forage; grasses and forbs. Therefore, the analysis with respect to plant productivity and survival due to herbivory focuses on the timing, duration, and utilization (intensity of grazing) of the available forage for each alternative.

Although the term "range improvements" encompasses many types of actions, there are only three types of range improvements proposed for the Sheep Allotment Complex, which include: exclosures, wells, and troughs associated with spring developments. The method of analysis of range improvements with respect to vegetation is to determine how the construction of the range improvement would impact the vegetation, how the function of the range improvement would affect vegetation, and how the range improvement would alter livestock behavior and subsequent effects to vegetation.

3.2.1.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

The previous grazing permits for the Sheep Allotment Complex provided for a total of 39,000 AUMs of authorized fall/winter/spring use for the allotments with grazing from approximately mid-November to the end of March or April, with the exception of the South Pasture of UT/NV #1 which was used until May 10 annually (Table 2-2). The Sugarloaf and White Horse allotments implemented deferred grazing of the salt desert shrub community after April 1. Wild horse AUMs were set at 1,730 for the year.

Average actual use over the period 1985 to 1999 was 17,573 AUMs, or 21,427 AUMs below the permitted use.

Plant Productivity

Under this alternative, the sheep would be in the allotments during the dormant season and would use the browse species through winter in addition to some use of dormant grasses. Early spring use would be a combination of browse and herbaceous plants. Browsing during the dormant season would remove the terminal buds and some lateral buds, or growing points, necessary for the initiation of growth during the spring. The result would be some reduction in plant growth during the growing season (i.e., fewer initial leaders and delay before dormant buds are activated). Browsing during the spring would contribute to reduction of annual growth by removing the new growth and possibly additional growth points. Current year's leader growth would be delayed and productivity would be reduced.

As indicated in **Table 2-2**, the period of use would be between four and six months, depending on the allotment. This is ample time for repeated browsing to occur, which would allow for more growing points to be removed during the winter months than under a shorter duration grazing regime. Under this system the intensity, as indicated by the Use Pattern Mapping and Key

Area Utilization monitoring (BLM 2000a, Sheep Allotment Complex Evaluation), was highly variable between years among the allotments between 1985 and 1999. The percentage of the allotment use pattern mapping that was mapped as moderate (i.e., 41 to 60 percent utilization) or greater (i.e., heavy - 61 to 80 percent; severe – 81 to 100 percent) for each year that use pattern mapping was conducted was averaged over the period 1985 to 1999. The mean, highest, and lowest percentages are presented in **Table 3-1**.

At moderate levels of utilization there is likely to be some reduction of growth or carbohydrate production in the shrubs. However, the moderate level of browsing is not likely to lead to plant mortality. At the heavy and severe levels, reduction in productivity during the growing season would result in shorter leaders and fewer buds being produced. Root growth would also be reduced as the photosynthate would be diverted to new leaves, buds, and leaders to maintain photosynthetic processes, rather than root replacement and growth. Repeated heavy and severe utilization would indicate a potential for loss of plant vigor and eventually loss of the plants, as less new growth is realized each successive year. As the amount of total new growth (i.e., forage) per plant decreases over time, the livestock take more bites per plant to remove the same amount of forage. The plants would soon reach a threshold where the amount of photosynthesis the plants are able to conduct is not sufficient to keep up with the maintenance requirements of the plant, leading to eventual plant mortality.

Table 3 - 1: Percentage of Allotment Use Pattern Mapping with Moderate or Greater Use, 1985 to 1999

Allotment/Pasture	Mean (percent)[1]	High (percent)	Low (percent)	Years Monitored
Leppy Hills	19.8	41.3	0	5
UT/NV #1 – North Pasture	14.8	46.1	3.7	6
UT/NV #1 – South Pasture	38.9	64.2	12.3	8
Lead Hills	35.8	57.9	13.9	8
White Horse	23.2	55.8	23.2	6
Sugarloaf	59.2	71.2	42.1	8
Ferber Flat	44.2	85.3	5.5	8
West White Horse	41.3	62.6	0	11
Boone Springs	18.7	29.5	4.8	7
Mean	32.9			

[1] Data from Appendix 1 of the 2000 Allotment Evaluation.

The allotment monitoring data indicate that while some reduction in growth and/or root growth/replacement was occurring, all of the allotments except Sugarloaf had moderate or greater utilization over less than one-half of the allotment, on average. Conversely, over half of the acreage in all the allotments except Sugarloaf was receiving slight to light use (i.e., 1 to 21 percent – slight and 21 to 40 percent – light). Continuation of this level of utilization should not result in a long-term reduction in productivity in these areas. However, in the areas receiving heavy to severe use, shrub productivity is anticipated to decline.

In the 67 years of combined monitoring over the nine allotments (during the period 1985 to 1999), only six years had utilization levels of heavy (61 to 80 percent) on more than ten percent of any one allotment. The highest percent of area that received heavy utilization was 21.7 percent on any allotment. Thus, the impacts to the shrubs have been occurring on relatively small areas and repetitive use was occurring on even less area. Nonetheless, the continuation of this level of browsing would not meet the rangeland health standards.

Similarly, the utilization at the Key Area monitoring locations within the allotments was below 50 percent utilization on the key shrub species with a few exceptions (BLM 2000a, Allotment Evaluation). Utilization of winterfat exceeded 50 percent several times on several allotments. However, winterfat, like sagebrush, maintains some leaf material during winter and is able to re-sprout after winter browsing, but does not respond well to growing season browsing.

Trend data used in the allotment evaluation indicated that ecological status at the Key Areas was variable with decreases and downward trend at some Key Areas and improvement or stable at other Key Areas.

As indicated in Table 2-2, the majority of the livestock use in these allotments would occur during the dormant season for the grasses, and sheep are primarily browsers during the winter. However, in areas were utilization levels of shrubs exceeds the moderate level, winter use of grasses may occur to the point were the growing points at the base of the plants could be impacted. Repeated heavy or severe use in the same areas would have a long-term impact on the grass plant vigor. The allotment monitoring data indicates that this impact may be occurring over limited portions of the allotments.

Potential for impact to cool season grasses occurs in the late winter/early spring use (late March to mid-May) when the grasses initiate growth and the growing points elevate as the tillers elongate. Removal of the growing points during this time period requires the plant to activate dormant buds, which requires diversion of the energy produced by photosynthesis. The rate of photosynthesis would be reduced by the removal of leaf tissue and the energy that is produced, would be diverted to initiating new growth, either activation of dormant buds or replacing removed tissue. Energy for root growth and replacement would be temporarily unavailable.

The early spring use has potential to impact the grasses in years when spring moisture is not abundant. The cool season grasses have the ability to regrow after herbivory if there are moisture and nutrients to support the growth. Therefore, the duration is relative to the amount of moisture available. Intensity of utilization with respect to the growing points is the most important factor with the spring grazing. The allotment evaluation data (BLM 2000a, Allotment Evaluation) indicates the utilization on Indian ricegrass (the key herbaceous forage species at most of the Key Areas) commonly exceeded 50 percent utilization. This level of utilization in the early spring when plant growth is just starting is likely to remove the growth points from the tillers. While an early season impact may occur, the removal of the livestock during the remaining portion of the growing season (i.e., late spring-summer and early fall) allows the plants to complete the growth cycle and conduct root growth and replacement. The existing frequency

monitoring data for the allotment is somewhat inconclusive with respect to long-term impacts to grasses because of the relatively few years for which frequency data was available and the variability between years in terms of growing conditions (i.e., soil moisture and temperature).

With respect to the indicators of plant vigor and carbohydrate production for root growth and replacement:

- The early spring use on the allotments would vary from April 1 to April 15, April 20, or April 30. Only the West White Horse and Boone Springs allotments complete grazing by March 31 each year. The system on the other allotments does not delay initial defoliation, and the early defoliation periods occur over short (i.e., 15 days) to long (i.e., 30 days) periods, annually.

- The grazing period ends when sufficient moisture exists to allow regrowth (in most years) and monitoring indicates that adequate leaf area remains at the conclusion of the grazing period to continue carbohydrate production and plant growth.

- The time between defoliation events is approximately six months and this period of non-grazing includes a portion of the springs/summer growing season, the summer dormancy period, and the fall growing/respiration period (for cool season grasses). Shrubs continue growing throughout the non-grazing period.

- Residual leaf area is sufficient for carbohydrate build-up and bud development.

This system is generally compatible with the growing and dormant periods of the vegetation communities, with the exception of the annual early spring grazing which has potential to affect cool season grass and shrub production and vigor. Localized heavy herbivory on shrubs and grasses in the winter may also impact the ability of these plants to grow, but this does not appear to be an allotment-wide problem. Under this alternative, localized, long-term impacts to shrubs and grasses would continue in areas that receive repeated heavy to severe utilization. As these localized areas exhibit the long-term reduction in plant growth and/or mortality, the livestock would be expected to expand the area of impact into adjacent vegetation. Rangeland health standards for the upland vegetation would not be met under this alternative.

Range Improvements

The primary impact of the existing range improvements on vegetation under this alternative was the concentration of livestock and wild horses at water sources. The instances of heavy and severe utilization were associated with the water sources – springs, seeps, troughs, wells, and water tank locations. This use was primarily attributed to year-long use by wild horses. The repeated use of the riparian shrubs and grasses, especially at the heavy to severe level, results in very little new above-ground growth each year and root growth and replacement are also reduced. This leads to decreased plant vigor and health over time. Repeated browsing of the shrubs removes the current year's growth and associated growing points, which stunts the plant growth and reduces productivity. As indicated above, the livestock are removed early in the season, which allows growth to occur each year. However, the summer-long use of these areas by wild horses does not allow sufficient rest from grazing to maintain vigorous shrub or grass plants at these riparian sites.

Non-Native, Invasive Species

Sheep can be vectors for the transfer of seed from one area to another by transporting the seed in the wool and hooves, and passing seed through the digestive tract. Due to the grazing period in these allotments, seed from non-native, invasive species have disseminated prior to turn in and seed has not yet been produced by the time the sheep have been removed from the allotments in the spring. Some seed may be

picked up in the hooves and wool while bedding, but this is not anticipated to be a major source of seed transfer.

There is also potential for the sheep to have seed in their wool from their summer range which was picked up before arriving at the allotments. This would be a source for new weeds to enter the allotments. The extent to which this is occurring is not known.

The range improvements, especially water sources, result in concentrations of the livestock at these locations. The level of disturbance at these sites created areas for non-native, invasive species to establish. However, these sites are used annually, and the hoof action that contributed to the loss of vegetation at these sites also has some controlling action on the non-native, invasive species (but is not a solution to this issue). A portion of this impact can also be attributed to wild horses.

Repeated use, both within a grazing season and between years, of bedding areas has led to large areas of cheatgrass on the foothill benches in the White Horse and West White Horse allotments. This appears to be the result of temperature inversions and the sheep move to the benches to be above the cold air layer and fog at the valley floor.

To date, the level of noxious weed infestations within the allotments has been low and is well within the ability of the BLM and permittees to control. However, the presence of noxious weeds increases the potential for more noxious weed infestations to occur as local seed sources now exist.

The disturbed areas associated with bedding sites and water sources have been invaded by cheatgrass. Continued use of these sites increases the potential for seed transfer and continued surface disturbance that provides suitable seedbed sites for other non-native, invasive species.

To date, the level of non-native, invasive species infestations throughout the allotment are increasing. These increases are beyond the control of the BLM and the permittee.

3.2.1.2.2 Alternative 2 – Implement the Multiple Use Decision

The grazing system proposed in the MUD is described in Section 2.3.2. The permitted livestock use of 26,652 AUMs under this alternative represents a reduction of permitted use of 12,348 AUMs from the previous grazing system (Alternative 1). However, the 26,652 AUMs permitted under this alternative would be 9,079 AUMs greater than the average actual use recorded between 1985 and 1999 (i.e., 17,573 AUMs).

Period of use for the nine allotments would be November to the end of April, depending on the allotment (**Table 2-4**). However, within the individual allotments, the Use Areas would have specified periods of use and permit the implementation of rest rotation or deferred rotation systems for specific Use Areas. Wild horse AUMs would be reduced to 568 AUMs, a reduction of 1,162 AUMs.

Plant Productivity

Under this alternative, the sheep would be in the allotments during the dormant season and would be using the browse species through winter. Early spring use would be on a combination of woody browse and herbaceous plants. Browsing during the dormant season would remove the terminal buds and some lateral buds, or growing points, necessary for the initiation of growth during the spring. The result would be some reduction in plant growth during the growing season (i.e., fewer initial leaders and delay before dormant buds are activated). Browsing during the spring would further reduce annual growth by removing the new growth and possibly additional growth points. Current year's leader growth would be delayed and productivity would be reduced.

However, due to the rest rotation and deferred rotation systems for the spring Use Areas, the effect on the shrubs would be limited to one Use

Area per year per allotment with rest on the other use area(s) during the early spring growing season. Therefore, impacts to shrub growth and production that occur in one year would be offset by the opportunity for the shrubs to recover during the next one or two years of rest. The shrubs in the rested Use Area would produce more leader growth relative to the previous grazing system (i.e., no rest) and have one or two years of complete rest to conduct root growth and replacement.

This alternative should improve the vigor of winterfat and other key shrubs due to the reduced growing season grazing of this species.

As indicated in **Table 2-4** and Section 2.3.2, the period of use within the allotments would be between four and six months, depending on the allotment. However, due to the implementation of Use Areas, the duration in any one location is reduced. The rotation of the spring Use Areas (and fall Use Area for Leppy Hills and UT/NV North allotments and winter Use Area for West White Horse Allotment) and deferment of Use Areas for Boone Springs Allotment would limit the amount of repeat browsing on shrubs that would occur, especially during the early growing season.

The intensity, or utilization level, is anticipated to be more uniform as the sheep would make more use of areas that historically received slight or light use. The Use Pattern Mapping and Key Area Utilization monitoring is likely to show more of the allotment in the light (21 to 40 percent) and moderate (41 to 60 percent) utilization levels on the previous year's growth. The monitoring should also indicate that less of the allotments are in the heavy to severe utilization levels. This would be in keeping with the allotment objective of 50 percent use or less on salt desert shrubs or other key shrub species. At moderate levels of utilization there is likely to be some reduction of plant above-ground growth or root growth in the shrubs. However, under this alternative, when the 50 percent utilization level is exceeded in all Use Areas, the livestock would be removed from the allotment in five days. Therefore, browsing the shrubs during the winter season with this utilization objective would leave sufficient growing points to allow sufficient leader growth and leaf production to maintain plant vigor.

The rest rotation of the spring Use Areas and shorter duration of spring use would reduce the intensity of browsing on the shrubs during the initial growth period. The spring utilization objective of 30 percent or less use of current year's growth of salt desert shrubs or other key shrub species, along with the rest of one to two years of these areas, would result in minimal effects to shrubs. This system should definitely improve the vigor of winterfat due to the reduced growing season grazing of this species.

As indicated in **Table 2-4**, the majority of the use in these allotments would occur during the dormant season for the grasses, and sheep are primarily browsers during the winter. Winter use of the grasses is not anticipated to exceed levels that would impact the growing points at the base of the plants.

Potential for impact to grasses occurs in the late winter/early spring use (March to mid-May) when the grasses initiate growth and the growing points elevate as the tillers elongate. The magnitude of this impact is based on duration and intensity of herbivory.

As described under Alternative 1, the early spring use has potential to impact the grasses in years when spring moisture is not abundant or when intensity of grazing results in too many new tillers and growing points removed. The cool season grasses have the ability to regrow after herbivory if there are nutrients and moisture to support the growth. Therefore, the duration is relative to the amount of moisture available. Under this alternative, none of the allotments receive spring use in May, and Boone Springs and West White Horse allotments receive no livestock use during the growing season. Therefore, grazing on all spring Use Areas should be completed when there is moisture available for regrowth, with the exception of extreme drought years.

Intensity or utilization with respect to the growing points is the most important factor with the spring

grazing. However, the rest rotation systems that would be implemented under this Alternative would allow the plants in Use Areas grazed in a dry spring to recover during the following one or two years of rest when the plants would complete their growth cycle in the absence of early spring sheep grazing. Therefore, over time the vigor of the grass plants should show improvement.

With respect to the indicators of plant vigor and root growth/replacement:

- The early spring use would occur on the allotments from April 1 to April 15, April 20, or April 30. Grazing on the West White Horse Allotment would be completed by February 28 each year under this alternative and grazing on the Boone Springs Allotment would be completed by March 31 each year. The system on the other allotments consists of rest rotation of the spring Use Areas. This does not delay initial defoliation, and the early defoliation periods occur over short (i.e., 15 days) to long (i.e., 30 days) periods; however, the rest rotation system provides time for recovery (see below).
- The grazing period ends when sufficient moisture exists to allow regrowth and adequate leaf area is anticipated to remain at the conclusion of the grazing period to continue growth and carbohydrate production.
- The time between defoliation events is at least six months for the winter Use Areas and up to two years for the early spring Use Areas. This is adequate for recovery of the grasses and shrubs.
- Residual leaf area is sufficient for carbohydrate build-up and bud development.

This system is compatible with the vegetation communities. The early spring defoliation is followed by one or two years of rest, which is adequate recovery time for the grasses and shrubs. Movement among the Use Areas limits the duration and intensity of herbivory on the shrubs and grasses.

Range Improvements

As indicated above, the implementation of the proposed grazing and reduction in wild horse numbers to AML are anticipated to address some of the issues identified in the allotment evaluation, such as the time, duration, and intensity of livestock grazing and time and intensity of wild horse grazing. However, duration of use by wild horses of the existing water sources and associated vegetation cannot be addressed by the proposed grazing system. The range improvements proposed under this alternative are primarily designed to address the intensity of use by wild horses at the seeps and springs and to provide water sources for better distribution of the livestock (i.e., reduce the intensity and duration of livestock grazing in the areas receiving heavy to severe use).

The proposed spring exclosures and troughs to deliver water outside of the exclosure would improve the vigor of the riparian vegetation associated with the seeps and springs by eliminating repeated use of these plants. Repeated use of the riparian vegetation has resulted in the removal of growing points of shrubs (willows) and grasses and subsequent loss of vigor. Trampling at these sites has also physically impacted the plants through mechanical sheering of the above-ground plant parts and soil compaction. Consequently, changes in the plant community have occurred at some locations. The proposed exclosures are anticipated to reverse the trend in declining plant vigor and changes in plant community composition.

Spring developments that leave water at the spring source would also be necessary to maintain the riparian vegetation.

Non-Native, Invasive Species

Implementation of the grazing system proposed under this alternative would reduce the repeated

use of bedding and foraging areas through rotation among Use Areas. This would reduce the mechanical effects of concentrated and repeated hoof action on the vegetation and soil surface, which provides a suitable seedbed for non-native, invasive species. By reducing the potential for these species to establish, and by improving the vigor of the native perennial shrubs and grasses, the proposed grazing system is anticipated to slow the spread of non-native, invasive species within the allotments.

Installation of the range improvements under this alternative would improve the condition of riparian vegetation at some of the springs within the allotments. Because degraded riparian areas are often the site of initial noxious weed and other non-native, invasive species infestations, the improved riparian conditions should result in fewer infestations of these undesirable species. Delivery of the water from these springs to troughs outside the exclosure would result in the concentration of wild horses and of livestock at the water sources within the upland plant community. While some impact to the upland vegetation is likely to occur and is likely to result in establishment of non-native, invasive species, the potential for establishment on these drier sites is less than within the degraded riparian areas, except for cheatgrass. Therefore, it is anticipated that there would be a net reduction in potential for establishment and spread of non-native, invasive species under this alternative.

3.2.1.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the grazing system would be the same as the system proposed under Alternative 2, except the seven spring exclosures would not be constructed. Permitted use under this alternative would be the same as for Alternative 2. The permitted livestock use of 26,652 AUMs under this alternative represents a reduction of permitted use of 12,348 AUMs from Alternative 1. However, the 26,652 AUMs permitted under this alternative would be 9,079 AUMs greater than the actual use recorded between 1985 and 1999 (i.e., 17,573 AUMs).

Plant Productivity

It is anticipated that the effect of implementation of this alternative would be the same as described above for Alternative 2 for the salt desert shrub and sagebrush plant communities. Overall improvement in the health and vigor of the plants would be achieved.

It is anticipated that the effect of implementation of this alternative would be the same as described above for Alternative 2 for the salt desert shrub and sagebrush plant communities. Overall improvement in the health and vigor of the plants would be achieved.

It is anticipated that the effect of implementation of this alternative would be the same as described above for Alternative 2 for the salt desert shrub and sagebrush plant communities. Overall improvement in the health and vigor of the plants would be achieved.

It is anticipated that the effect of implementation of this alternative would be the same as described above for Alternative 2 for the salt desert shrub and sagebrush plant communities. Overall improvement in the health and vigor of the plants would be achieved.

With respect to the indicators of plant vigor and root growth/replacement:

- The early spring use would occur on the allotments from April 1 to April 15, April 20, or April 30. Grazing on the West White Horse Allotment would be completed by February 28 each year under this alternative and grazing on the Boone Springs Allotment would be completed by March 31 each year. The system on the other allotments consists of rest rotation of the spring Use Areas. This does not delay initial defoliation, and the early defoliation periods occur over short (i.e., 15 days) to long (i.e., 30 days) periods; however,

the rest rotation system provides time for recovery (see below).

- The grazing period ends when sufficient moisture exists to allow regrowth and adequate leaf area is anticipated to remain at the conclusion of the grazing period to continue carbohydrate production.
- The time between defoliation events is at least six months for the winter Use Areas and up to two years for the early spring Use Areas. This is adequate for recovery of the grasses and shrubs.
- Residual leaf area is sufficient for carbohydrate production and bud development.

This system is compatible with the upland vegetation communities. The early spring defoliation is followed by up to two years of rest, which is adequate recovery time for the grasses and shrubs. Movement among the Use Areas limits the duration and intensity of herbivory on the shrubs and grasses.

Range Improvements

Continued season-long use of the riparian vegetation by wild horses would occur under this alternative, but by fewer wild horses. The repeated use of the riparian shrubs and grasses, even by reduced horse numbers, would result in very little growth or replacement of root systems, which would lead to decreased plant vigor and health over time. Repeated browsing of the shrubs removes the current year's growth and associated growing points, which stunts the plant growth and reduces productivity.

It is anticipated that the improvement in riparian areas would be modest under this alternative.

Non-Native, Invasive Species

The effects with respect to non-native, invasive species under this alternative would be similar to the effects as described under Alternative 1, but to a lesser degree. Increased infestations of non-native, invasive species would be expected to occur, with initial infestations occurring within the riparian areas at springs that would be slowly recovering from past use. Livestock and wild horses would continue to use these sites for water, and seeds of the undesirable species would be spread by the animals and other dispersing agents (i.e., wind and humans) to other locations within the allotment.

3.2.1.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

The white sage or winterfat plant community and sage grouse nesting habitat were identified as key sensitive species habitats that would be addressed under this alternative. Early spring grazing would be eliminated and grazing would be restricted to the dormant season. One month of use would be eliminated, affecting permittee's movement to other allotments in Utah or leading to permittee having to provide forage elsewhere. Shearing would take place elsewhere.

The permitted livestock use under this alternative would be 25,079 AUMs. The reduction in AUMs necessary to implement this alternative would be 13,353 AUMs less than Alternative 1 and 1,573 AUMs less than Alternatives 2 and 3. However, the 25,079 AUMs permitted under this alternative would be 7,506 AUMs greater than the average actual use recorded between 1985 and 1999 (i.e., 17,573 AUMs). Wild horse AUMs would be the same as for Alternatives 2 and 3, and 1,162 less than for Alternative 1.

Plant Productivity

Under this alternative all grazing in the Sheep Allotment Complex would occur between November 1 and March 31 each year, and several of the allotments have rotations for Use Areas during the period March 1 to March 31 and/or Use Areas that would be excluded from livestock during specified periods each year (e.g., Morris Basin in the Leppy Hills and Morgan Basin in UT/NV North Allotment). Therefore, essentially all of the herbivory would take place during the

dormant period or for a short duration on some plants that start growth in March. Consequently, the timing of the herbivory would occur when the least impact to the shrubs is likely to occur.

The allotment grazing plans under this alternative also include Use Areas for the winter months that have utilization standards. The maximum utilization on last year's growth would be 50 percent and the livestock would be moved to the next Use Area. Upon reaching the 50 percent utilization level throughout the winter Use Areas, or reaching the end of the specified grazing period, the livestock would be removed from the allotment.

The rotation of the herbivory during the period March 1 to March 31 that includes rest two out of three years for most late winter Use Areas would protect the shrubs during the period when the shrubs may be breaking dormancy. Herbivory on any new growth would be extremely limited in extent and followed by two full years of growing season rest. Therefore, the duration and intensity of herbivory during winter and late winter would be limited to an extent that would allow substantial growth of roots and above ground leaders during the spring and summer following the winter use.

All grazing of the grasses would occur while the grasses are dormant. Thus grazing would occur at a time when plants are least susceptible to impact because the growing points are close to the ground in the base of the plants. Occasionally, when spring temperatures occur early in the season, some early defoliation of new growth may occur.

Under this alternative, the implementation of Use Areas, late winter Use Area rest rotation, reduction in permitted AUMs, and the absence of early spring grazing would provide sufficient protection of the growing points on the grasses to allow cool season grasses to complete their growth cycle and replace roots each year. The warm season grasses would not experience any measurable effect under this alternative.

With respect to the indicators of plant vigor and carbohydrate reserve replenishment:

- The early spring use would not occur on the allotments. All grazing would be completed by March 31 each year. Therefore, early defoliation would not occur, and plants would be able to complete the growth cycle in the absence of livestock grazing, except in years when spring arrives early.
- Adequate leaf area would remain at the conclusion of grazing because growth would not be initiated before grazing ceases.
- The time between defoliation events is at least six months for the winter Use Areas. The late winter Use Areas would be rotated, providing two full years of rest.
- Residual leaf area is sufficient for carbohydrate build-up and bud development.

This system is compatible with the vegetation communities. The late winter use is followed by two years of rest, which is adequate recovery time for the grasses and shrubs. Movement among the Use Areas limits the duration and intensity of herbivory on the shrubs and grasses. This system would benefit winterfat communities by eliminating any growing season use of this species.

Range Improvements

The implementation of the proposed grazing and reduction in wild horse numbers to AML are anticipated to address some of the issues identified in the allotment evaluation, such as the time, duration, and intensity of livestock grazing and time and intensity of wild horse grazing of sensitive species' key habitats. However, duration of use by wild horses of the existing water sources and associated vegetation cannot be addressed only by the proposed grazing system. The range improvements proposed under this alternative are primarily designed to address the

intensity of use by wild horses at the seeps and springs and to provide water sources for better distribution of the livestock (i.e., improve intensity and duration of livestock grazing).

The proposed spring exclosures and troughs would deliver water outside of the exclosure resulting in improved vigor of the riparian vegetation associated with the seeps and springs by eliminating repeated use of these plants. Repeated use of the riparian vegetation has resulted in the removal of growing points of shrubs (willows) and grasses and subsequent loss of vigor. Trampling at these sites has also physically impacted the plants through mechanical sheering of the above-ground plant parts and soil compaction. Consequently, changes in the plant community have occurred at some locations. The proposed exclosures are anticipated to reverse the trend in declining plant vigor and changes in plant community composition.

The extent of this improvement would depend on how much water is left at the spring source to maintain the riparian zone. Some reduction in the extent of the riparian zone is anticipated under this alternative with the removal of some of the water to troughs.

Non-Native, Invasive Species

Implementation of the grazing system proposed under this alternative would reduce the repeated use of bedding and foraging areas. This would reduce the mechanical effects of concentrated and repeated hoof action on the vegetation and soil surface, which provides a suitable seedbed for non-native, invasive species. By reducing the potential for these species to establish, and by improving the vigor of the native perennial shrubs and grasses, the proposed grazing system is anticipated to reduce the spread of non-native, invasive species within the allotments.

Installation of the range improvements under this alternative would improve the condition of riparian vegetation at some of the springs within the allotments. Because degraded riparian areas are often the site of initial noxious weed and other non-native, invasive species infestations, the improved riparian conditions should result in fewer infestations of these undesirable species. Delivery of the water from these springs to troughs outside the exclosure would result in the concentration of livestock at the water sources within the upland plant community. While some impact to the upland vegetation is likely to occur and is likely to result in establishment of non-native, invasive species, the potential for establishment on these drier sites is less than within the degraded riparian areas. Therefore, it is anticipated that there would be a net reduction in potential for establishment and spread of non-native, invasive species under this alternative.

3.2.2 Wetland/Riparian Zones

3.2.2.1 Affected Environment

The regulatory framework with respect to wetland/riparian zones is provided in **Appendix B**.

There are no perennial streams within the Sheep Allotment Complex. Precipitation averages only six to seven inches at the valley floors and as much as six to ten feet of snow may accumulate in the high mountain elevations. The limestone bedrock within the Goshute Mountains and Toano Range is highly fractured and most of the snowmelt enters the groundwater system. Springs and seeps are characterized by limited flows and narrow zones of wet and dry meadows. Vegetation is predominantly sedges, rushes, chokecherry, and bluegrass. Chokecherry and willow occur at some spring sites. Springs within the allotments are indicated on **Map 2-2**. Mud Springs on the UT/NV North Allotment has been fenced and cottonwood reproduction occurs both within and outside of the fenced spring area.

3.2.2.2 Environmental Consequences

The Sheep Allotment Complex is used by sheep during the late fall through early spring. While winter snow and precipitation provide some water, the amount and availability vary by year. The springs and other water developments are

dependable water sources for the livestock. Wild horses and wildlife inhabit the area on a year-round basis. The springs are primary water sources for these animals, with increased importance in late summer.

With respect to riparian vegetation, sheep are primarily browsers during the fall and winter, feeding on shrubs and only a limited use of dry grasses or riparian vegetation. In the spring, sheep transition from browse to herbaceous forage, and riparian areas are somewhat more attractive as foraging areas. However, the sheep are removed from the allotments well before the hot season.

3.2.2.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Although livestock grazing was a causal factor in not meeting some riparian allotment objectives and rangeland health standards, much of the failure to meet these objectives was attributed to wild horses. The year-long use of the spring and seep areas by wild horses under this alternative would impact vegetation due to the time, duration, and intensity of the grazing at these locations. Livestock would be removed early in the spring, prior to the hot season, and would not have much effect on riparian vegetation. However, wild horse use would continue during the hot season. Improvement of the riparian vegetation is not anticipated under this alternative. Potential for non-native, invasive species to establish at riparian areas would be high under this alternative.

3.2.2.2.2 Alternative 2 – Implement the Multiple Use Decision

Under this Alternative, seven spring areas would be protected by construction of exclosures and development of water troughs outside the exclosures. Livestock use of the riparian vegetation associated with these seven springs would be eliminated. Similarly, wild horse use of these areas, especially during the hot season, would be eliminated. The spring and riparian vegetation would return to functioning condition. Other springs for which exclosures are not proposed would continue to be impacted by wild horse use, but the impacts are likely to be less due to the reduction in wild horse numbers under this alternative.

3.2.2.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

The changes in livestock grazing would not measurably improve the riparian vegetation condition because the livestock are removed before the use of riparian vegetation is a concern. The impact to riparian vegetation has been attributed to wild horse use of these areas during the hot season. The reduction in wild horses under this alternative would be to the same AML as for Alternative 2. However, even at AML, wild horses may concentrate at these water sources and the riparian vegetation may not recover, or may not recover as quickly, as under Alternative 2. Other springs for which exclosures are not proposed would continue to be impacted by wild horse use, but the impacts to all springs are likely to be less due to the reduction in wild horse numbers under this alternative as compared to Alternative 1. Achievement of the riparian rangeland health standard is not anticipated under this alternative, at least in the short-term.

3.2.2.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this Alternative, seven spring areas would be protected by construction of exclosures and development of water troughs outside the exclosures. Livestock use of the riparian vegetation associated with these seven springs would be eliminated. Similarly, wild horse use of these areas, especially during the hot season, would be eliminated. The spring and riparian vegetation would return to functioning condition. Other springs for which exclosures are not proposed would continue to be impacted by wild horse use, but the impacts are likely to be less

due to the reduction in wild horse numbers under this alternative.

3.2.3 Avian Sensitive Species

3.2.3.1 Affected Environment

The regulatory framework with respect to avian sensitive species is provided in **Appendix B**.

Based on the Minute Order issued by Judge McKibben, the species for which analysis was required in the Sheep Allotment Complex included northern goshawk, golden eagle, short-eared owl, long-eared owl, burrowing owl, flammulated owl, ferruginous hawk, Swainson's hawk, prairie falcon, and peregrine falcon. Sage grouse also occur within the complex within the Boone Springs Allotment. A description of the habitat requirements and food habits of each species is provided below.

Golden Eagle

Golden eagles breed in a variety of habitats, generally in open country such as shrub-steppe, grassland, desert, savanna and alpine tundra; they may also be found in open wooded country (NatureServe 2005). Golden eagles are most often found in hilly or mountainous regions, and typically breed in Nevada at elevations between 7,000 to 9,000 feet (Nevada Natural Heritage Program 2005).

Golden eagles nest primarily on cliffs, although they will also use large trees or artificial structures (Kochert et al. 2002). Eagles may nest on the ground in parts of Nevada where cliffs and trees are scarce (Seibert et al. 1976); ground nests are usually placed on hillsides (Ward et al. 1983). Cliff nests are built on several rock substrates including sandstone, shale, granite gneiss, limestone, basalt, and granite (Schmalzried 1976); loose substrates are avoided (Baglien 1975). Nesting substrates range between zero to 350 feet in height, with an average cliff height of 116 feet (Kochert et al. 2002). In Nevada, nest sites were found with a full range of aspects, with and without overhangs, and often but not exclusively near updrafts (Seibert et al. 1976). Each pair requires several suitable nest sites; pairs typically establish several nests within their breeding territories (NatureServe 2005). Some nests will be used repeatedly in consecutive years, while others are used on a rotational basis. Historic nests may be used by the same pair over a period of decades.

Golden eagles feed primarily on small mammals such as jackrabbits and ground squirrels, and may also eat insects, snakes, birds, juvenile ungulates, and carrion. Eagle reproductive success has been linked to jackrabbit numbers (NatureServe 2005). Eagles rarely attack large, healthy mammals (e.g. deer, sheep) (Terres 1980). Eagles will hunt aloft and from perches when available.

Golden eagles have been documented within the Sheep Allotment Complex. Nesting occurs within the limestone rock cliffs in the canyons of the Goshute Mountains and Toano Range. Foraging occurs along the foothills, benches, and valleys.

Northern Goshawk

Large tracts of mature or old-growth forest are the primary breeding and foraging habitats for northern goshawks (NatureServe 2005). Nests are typically constructed in the largest trees of dense, mature stands with high canopy closure (60 to 95 percent) and sparse groundcover, although goshawks will rarely nest in relatively open stands (ten percent canopy coverage). In western North America, goshawks typically nest in coniferous forests dominated by ponderosa or lodgepole pine. They also commonly nest in mixed forests dominated by fir, Douglas-fir, cedar, spruce or larch. Northern goshawks may also nest in deciduous forests dominated by aspen, paper birch or willow. Foraging sites typically have higher canopy coverage, greater tree density and greater density of large trees than non-foraging sites, even where foraging sites have lower prey abundance (Beier and Drennan 1997). In Nevada, however, goshawks may commonly forage in open sagebrush-steppe adjacent to riparian aspen stands (Younk and Bechard 1992). Although they are generally

associated with remote habitats, goshawks may rarely forage in agricultural or suburban areas if they contain abundant prey (Palmer 1988). In Nevada, goshawks typically breed at elevations between 7,000 to 8,800 feet (Nevada Natural Heritage Program 2005). Habitat requirements during winter are poorly understood, but appear similar to breeding habitat requirements. Non-forested habitats may be used in proportion to their availability, while large tracts of mature forest are used preferentially (Widen 1989).

Nests are most commonly found near the bottom of moderate slopes and near water or dry openings (NatureServe 2005). Nest height ranges from 8 to 150 feet; one to eight nests may be reused in consecutive years (Squires and Reynolds 1997).

Goshawks feed opportunistically on a wide variety of vertebrates and rarely insects (NatureServe 2005). Mammals typically comprise 39 to 76 percent of goshawk diets, while birds comprise all but one percent of the remainder. In Nevada, goshawk diets studied by Younk and Bechard (1994) contained 67 percent mammals and 32 percent birds. Tree squirrels, ground squirrels and rabbits are the dominant mammalian prey; dominant avian prey includes galliformes (grouse, pheasants), corvids (jays, magpies), woodpeckers and robins (NatureServe 2005). Fledgling song birds are an important diet component when available.

Within the Sheep Allotment Complex, habitat for goshawks occurs at the upper elevation woodland areas, drainages, and spring habitats.

Ferruginous Hawk

In the Great Basin, ferruginous hawks primarily occupy sagebrush-steppe habitats, saltbush-greasewood shrublands, grasslands and peripheries of pinyon-juniper and other woodlands (Niemuth 1992, Bechard and Schmutz 1995, Houston 1995, Leary et al. 1998). They typically occupy rolling or rugged terrain, and generally avoid high elevations, narrow canyons and forest interiors (Palmer 1988). Open landscapes with moderate cover (greater than 50 percent) are preferred for nesting and foraging (Wakeley 1978, Bechard et al.1990, Leary et al. 1998), and they typically avoid dense or tall vegetation that reduces their ability to see prey (Howard and Wolfe 1976, Wakeley 1978, Schmutz 1987). Ferruginous hawks will also forage in pastures, but generally avoid areas of intensive agriculture or human activity (NatureServe 2005).

Ferruginous hawks nest in tall trees, willows or juniper, cliff ledges, river-cut banks, or sloped ground, and may also nest on artificial structures such as power poles. Nest site selection depends upon available substrates and surrounding land use. Ground nests are typically located far from human activities and on elevated landforms. Lone or peripheral trees are preferred over densely wooded areas when trees are selected as the nesting substrate (NatureServe 2005). In eastern Nevada, ferruginous hawks nest almost exclusively in Utah juniper (Perkins and Lindsey 1983).

Mammals are the primary prey during the breeding season, although birds, amphibians, reptiles, and insects also are taken. Jackrabbits dominate the diet in some areas, followed by ground squirrels and pocket gophers (Smith and Murphy 1978, Bechard and Schmutz 1995). Populations feeding on jackrabbits appear to fluctuate cyclically with their prey (Bechard and Schmutz 1995). Ferruginous hawks in areas with high prairie dog densities depend heavily on this species.

Ferruginous hawks within the Sheep Allotment Complex nest along the ecotone of the pinyon-juniper and sagebrush vegetation on the benches. Foraging is primarily in the sagebrush and salt desert shrub habitats.

The State conservation goals for ferruginous hawk are:

- to maintain stable or increasing populations of ferruginous hawks throughout their present range in northern Nevada;

- within the nesting range, maintain isolated mature Utah juniper trees along the ecotone between pinyon-juniper and sagebrush habitats; and
- implement livestock grazing management that would promote a healthy, diverse native forb and white sage component in all valley sagebrush habitats.

Swainson's Hawk

Swainson's hawks breed and winter in sagebrush-steppe, grassland and some cultivated habitats, often containing scattered trees such as juniper or aspen (American Ornithologists' Union 1983, Maser et al. 1994). In Nevada, Swainson's hawks typically breed at elevations between 3,900 to 7,200 feet (Nevada Natural Heritage Program 2005).

Swainson's hawks typically nest in solitary trees, bushes or small groves, and occasionally on rock ledges. They commonly occupy abandoned corvid (crow, magpie) nests, and readily nest in shelterbelts and similar situations produced by humans (Gilmer and Stewart 1984). In the Great Basin, junipers are more commonly used for nesting than riparian trees (Biosystems Analysis, Inc. 1989).

Vertebrates dominate Swainson's hawk diets during the breeding season; young ground squirrels and pocket gophers are the primary prey at this time (NatureServe 2005). Invertebrates are commonly consumed, particularly grasshoppers and crickets. Non-breeders may also consume more insects in summer. Depending on availability, Swainson's hawks will also eat other small mammals, snakes, lizards, birds, amphibians and carrion.

Swainson's hawks are open-country birds in Nevada and in the Sheep Allotment Complex. While not common, this species has been observed in the salt desert shrub and sagebrush communities.

Prairie Falcon

Prairie falcons breed primarily in open habitats, particularly grasslands, shrub-steppe and alpine areas (American Ornithologists' Union 1983). They may also nest near agriculture, riparian areas and wetlands (NatureServe 2005). Falcons typically nest on rocky cliffs or steep embankments, in well-sheltered ledges or cliff potholes 30 to more than 300 feet high. When suitable cliff habitat is unavailable for nesting, trees, power lines, buildings, and caves may be used, as well as abandoned nests constructed by ravens, hawks and eagles. Falcons commonly change nest sites within territories in successive years (Palmer 1988).

Prey species abundance is the most important characteristic associated with nest site preference (Neel 1999). Populations in prey-rich areas may be limited by a scarcity of suitable nest sites; artificial structures and artificial excavations into existing cliffs are readily accepted by breeding falcons in these areas (Cade 1982, Evans 1982).

In Nevada, prairie falcons feed primarily on Townsend's ground squirrels (Neel 1999). They will also feed opportunistically on mammals, lizards and birds, generally up to the size of quail and rabbits (NatureServe 2005). Large insects are occasionally eaten, especially by juveniles. In winter, falcons often take horned larks on fields of winter wheat. Prairie falcons usually capture their prey on or near the ground; they may also rapidly pursue birds in flight (Palmer 1988).

This species has been observed nesting in the Sheep Allotment Complex on cliffs and rock ledges. Foraging occurs over the sagebrush and salt desert shrub communities.

Peregrine Falcon

Peregrine falcons will breed, winter, and migrate in a wide variety of habitats, with deserts, tropical forests, and mountains above 12,500 feet the only major exceptions (NatureServe 2005). While they typically nest on cliffs near water, they will occasionally nests in tree branches, cavities or artificial structures such as buildings (White et al. 2002). They may winter in open-relief habitat

devoid of cliffs, including rangelands, wetlands, river valleys and lake shores. In Nevada, peregrines typically breed at elevations between 2,000 to 6,000 feet (Nevada Natural Heritage Program 2005).

Peregrines typically nest on cliffs ranging from about 25 to 1,300 feet high; cliffs 150 to 650 feet high are preferred (White et al. 2002). Peregrines typically choose natural ledges and fissures in the cliff face as their nesting sites; human-made potholes dug into cliffs may also be accepted as nest sites (NatureServe 2005). Cliffs and other tall features are also important foraging perches in the winter months and during migration. Pairs nest at traditional sites year after year, and are often fidelic to winter foraging sites as well (White et al. 2002).

Birds comprise 77 to 99 percent of peregrine diets (Sherrod 1983). Avian prey species may range in size from hummingbirds to sandhill cranes, and may include 2,000 species world-wide (White et al. 2002). Pigeons, doves, and waterbirds are most frequently chosen as prey. Small mammals (bats, microtines, ground squirrels and rats) are occasionally taken, and very rarely amphibians, fish, insects and carrion.

Peregrine falcons were known to nest in the area as late as 1960. This historic peregrine falcon use area was designated as the Salt Lake ACEC in the Wells RMP (BLM 1983) to maintain the character of this area. Peregrine falcons are transients that are observed annually during the fall migration in the Goshute Mountains. However, there currently are no documented active nesting areas within the Sheep Complex Allotment.

Short-eared Owl

Short-eared owls breed in open country including grasslands, marshes, low shrublands and hayfields with abundant small mammal populations (Holt and Leasure 1993). They may also hunt in agricultural fields in winter. Size requirements for potential habitat are often 100 acres or larger (NatureServe 2005).

Nest sites vary with habitat type, but are often found in patches of tall, dense vegetation such as bulrush or on hilltops slightly elevated from the rest of the habitat (Holt and Leasure 1993). Short-eared owls may benefit from ecotones, where protected nest sites with dense shrub cover are adjacent to the wetland and grassland areas most suitable for foraging (NatureServe 2005). Nests are placed on the ground.

Small mammals, particularly voles, are the dominant prey of short-eared owls (Holt and Leasure 1993). These owls will also occasionally prey on passerines and insects (Erlich et al. 1988).

The mixture of low sagebrush habitats and salt desert shrub provide suitable habitat for this species within the Sheep Allotment Complex.

Long-eared Owl

Long-eared owls are most typically found along ecotones, as they forage in open habitats with abundant mammalian prey and roost in dense vegetation with protective cover (Marks et al. 1994). Foraging habitat may include grasslands, shrublands, deserts, forest openings, wetlands or farmlands, while roosting habitat may include stands of willows, cottonwoods, junipers, palo verde, saltcedar (tamarisk), coniferous or deciduous forests. Elevations range from near sea level to greater than 6,500 feet. The same tree groves are often used by long-eared owls for roosting in both the breeding and winter seasons (Wijnandts 1984), and communal roosts may form in preferred winter habitats.

Long-eared owls nest in large trees (nests four to 30 feet high and typically mid-height in tree), in groves greater than 30 feet wide (Marks et al. 1994). They do not build their own nests but are dependent on nests built and abandoned by corvids (magpies, crows) and diurnal raptors. Their productivity may thus be linked to the breeding population densities of these species. Long-eared owls rarely nest in squirrel nests, tree or cliff cavities, or on the ground. Nests are rarely reused by the same owl pair in subsequent years, but may be used by other pairs.

Long eared owls feed on a variety of small mammals ranging in mass from 0.5 ounces to three ounces (typically 0.8 to 1.5 ounces); voles predominate (Marks et al. 1994). Pocket mice and kangaroo rats are important prey in arid areas. Passerines and rarely reptiles are also eaten, but mammals comprise 93.5 to 99.9 percent of diet in North America. Long-eared owls typically hunt in open areas and will also forage below the canopy in open forests (Marks et al. 1994).

The combination of pinyon-juniper on the mountains and benches, sagebrush habitats on the benches, and salt desert shrub habitat in the valleys provides the variety of habitats uses by this species within the Sheep Allotment Complex.

Western Burrowing Owl

Burrowing owls typically inhabit open grasslands and savannas, and will sometimes nest in vacant lots near airports or human habitation (NatureServe 2005). They are found most often in areas with short vegetation, where they spend much of their time on the ground or on low perches such as fence posts or dirt mounds. Burrowing owls will very rarely dig their own burrows and depend on burrowing mammals to provide nest sites. They may nest in abandoned burrows excavated by prairie dogs, ground squirrels, foxes, marmots, badgers, and tortoises (Green and Anthony 1989). They may also nest in lava cavities in some areas (NatureServe 2005). Owls regularly modify and maintain their nest burrows, which may quickly become unsuitable for future nesting if abandoned. Availability of nest burrows appears to be of greater importance than any other habitat feature (NatureServe 2005).

Burrowing owls feed primarily on large insects and rodents, although they will also feed opportunistically on birds, reptiles and amphibians (NatureServe 2005). Prey is captured in flight or on the ground.

Burrowing owls have been documented in the Sheep Allotment Complex. The low sagebrush and black sagebrush communities, along with the salt desert shrub communities, provide suitable habitat for this species within all the allotments in the Sheep Allotment Complex.

The State conservation goal for burrowing owl is to stabilize the current decreasing population trend of burrowing owls in Nevada.

Flammulated Owl

Flammulated owls are found in most of Nevada's forested ranges (McCallum 1994c). Although they are most commonly found in montane ponderosa pine forests, they may also breed in other cool, dry, coniferous habitats or aspen (McCallum 1994c). These owls appear to be absent from pine forests with high temperatures and humidity (McCallum 1994c). Breeding owls typically select forests which include structural diversity. Large, old trees and snags provide nesting cavities, open, old growth stands and the edges of clearings provide optimal foraging habitat for their arthropod prey, and thickets of dense saplings and/or shrubs provide optimal roosting habitat with greater cover from predators (McCallum 1994c). Survival and reproduction may be higher in older forests (Reynolds and Linkhart 1992), though this result may have been confounded by aspect or other factors (McCallum 1994c). Flammulated owls are typically found in the mid-elevational range (McCallum 1994c), and breed in Nevada at elevations between 5,800 and 6,000 feet (Nevada Natural Heritage Program 2005).

Tree cavities are required for nesting. Although natural cavities are also used, old woodpecker holes are preferred, particularly those excavated by pileated woodpeckers, northern flickers, and to a lesser extent sapsuckers. Flammulated owls also breed in artificial nest boxes (McCallum 1994c). Limited availability of nest cavities in optimal foraging habitat may limit reproduction for this and other cavity-nesting species. Flammulated owls have been recorded usurping nest cavities from bluebirds and flickers, and have been killed by flying squirrels which later usurped their nests (McCallum 1994c).

Nocturnal insects such as owlet moths, other moths, beetles, bugs, crickets and grasshoppers dominate the diet of flammulated owls, depending on availability (McCallum 1994c). Other arthropods such as spiders, centipedes and scorpions are less commonly taken (Erlich et al. 1988). During especially cold periods when most insects are inactive, noctuid moths may be the only prey source available to flammulated owls (McCallum 1994c); stable and adequate populations of these moths are thus essential to owl population viability. Prey is captured from the foliage of canopy and understory shrubs, in the air, and on the ground (McCallum 1994c).

Potential habitat for this species occurs at the upper elevations in the conifer woodlands of the Goshute Mountains.

Sage Grouse

Within Nevada, sage grouse are presently distributed from the approximate center of Nevada northward, with the northeastern block of counties providing the most continuous habitat (Nevada Division of Wildlife [NDOW] 2000). The distribution of historic and current leks within Elko County suggests that sage grouse are found where sagebrush has dominated the landscape, historically or presently.

Sage grouse use a variety of habitats throughout the year. Breeding occurs at leks or strutting grounds, which are traditional, with the same lek sites used year after year (Scott 1942, Batterson and Morse 1948, Wiley 1978, Autenrieth 1981). Leks are generally small open areas from 0.2 to 12 acres in size, with either low or no sagebrush and surrounded by taller more dense sagebrush. The big sagebrush on the outskirts of the leks is necessary as a food source, for escape cover, for nesting females, and for loafing during the day (Patterson 1952, Gill 1965, Klebenow 1985).

Habitats used by pre-laying hens provide forbs that are high in calcium, phosphorus, and protein, all of which are necessary for egg production. These are generally sagebrush habitats with shrub cover less than 15 percent.

Nesting habitat is characterized by primarily Wyoming big sagebrush communities that have 15 to 38 percent canopy cover and a grass and forb understory (Connelly et al. 1991, Gregg et al. 1994, Sveum et al. 1998a). Residual cover of grasses is also important (Klebenow 1969, Connelly et al. 1991, Gregg 1991, Gregg et al. 1994, Sveum et al. 1998a), ranging from 3 percent to 30 percent cover at successful nest sites. Reported shrub height at nest sites ranged from nine inches to 39 inches (Patterson 1952, Klebenow 1969, Autenrieth 1981, Gregg et al. 1994, Sveum et al. 1998a, Schroeder et al. 1999). Autenrieth (1981) found that a “bush providing an umbrella effect” was preferred.

When considered on a range-wide basis, optimum brood-rearing habitat consists of sagebrush stands that are 16 to 32 inches tall with a canopy cover of ten percent to 25 percent and an herbaceous understory of 15 percent grass canopy and ten percent forb canopy (this is consistent with nesting habitat). Ideally, this type of habitat would be found on at least 40 percent of the area that is considered brood-rearing habitat (Connelly et al. 2000). Hens with broods use sagebrush habitats that have less canopy cover (about 14 percent) than that provided in optimum nesting habitat (Martin 1970, Wallestad 1971), but need at least 15 percent cover of grasses and forbs (Sveum et al. 1998b). Optimum canopy cover within brood-rearing habitat is specific to each vegetation type and range-site potential. The habitats used during the first few weeks after hatching need to provide cover to conceal the chicks, but more importantly, to provide the nutritional requirements of this period of rapid development. Brood-rearing habitats that have a wide variety of plant species tend to provide a corresponding variety of insects that are important chick foods.

Summer habitat consists of sagebrush mixed with areas of wet meadows, riparian, or irrigated agricultural fields (Connelly et al. 2000). Sage grouse broods occupy a variety of habitats throughout the summer including sagebrush, wet meadows, farmland, and other irrigated areas adjacent to sage brush. In general, a sagebrush

ecosystem with a good understory of grasses and forbs, and associated wet meadow areas, are essential for optimum habitat.

As upland habitats begin to dry up sage grouse broods move to more mesic wet meadows, where succulent grasses and insects are still available (Savage 1968, Schlatterer and Pyrah 1970, Oakleaf 1971, Neel 1980, Autenrieth 1981, Klebenow 1985, McAdoo et al. 1986). This can be especially important in drier years and during long drought periods.

Sage grouse form flocks as brood groups break up in early fall. As the meadows dry and frost leads to the drying and killing of forbs, the sage grouse diet shifts primarily to sagebrush leaves (Patterson 1952, Connelly and Markham 1983, Connelly et al. 1988, Wallestad 1975). As fall progresses toward winter, sage grouse move toward their winter ranges. Exact timing of this movement varies depending on the sage grouse population, geographic area, overall weather conditions, and snow depth. Sagebrush is essential for survival during the fall, winter, and early spring months.

Fall habitat in northeastern Nevada consists of mosaics of low-growing sagebrush (e.g., low sagebrush or black sagebrush) and big sagebrush (basin and Wyoming). As with the other seasons of the year, a mosaic of sagebrush vegetation (different species, different cover values, different height classes, etc.) provides the necessary food and cover requirements during the fall period. Studies in Elko County (Barrington and Back 1984) found that low sage was the preferred foraging and night roosting habitat during the fall. Sage grouse roosted in the big sagebrush types during the day, or during nights when winds were strong or the weather consisted of rain or snow.

Seasonal movements are related to severity of winter weather, topography, and vegetative cover (Beck 1977). Sagebrush canopy at sage grouse winter use sites can be highly variable (Patterson 1952, Eng and Schladweiler 1972, Wallestad et al. 1975, Beck 1977, Robertson 1991). However, sage grouse habitats must provide adequate amounts of sagebrush because their winter diet consists almost exclusively of sagebrush. It is crucial that sagebrush be exposed at least ten to 12 inches above snow level as this provides both food and cover for wintering sage grouse (Barrington and Back 1984, Hupp and Braun 1989). Wallestad (1975) found that in Montana less than ten percent of the range was available when snow depth exceeded 12 inches. If snow covers the sagebrush, the birds will move to areas where sagebrush is exposed.

From the preceding discussion it is evident that although sage grouse are sagebrush obligates, they use a variety of habitats. Sagebrush habitats vary from low growing to taller sagebrush species, and from plant communities with sparse sagebrush cover to those with relatively high shrub cover. The amount of herbaceous cover also varies between seasonal habitats. There are also important seasonal habitats that do not have a sagebrush component (e.g., riparian meadows), but generally have sagebrush nearby. Sage grouse have also been observed in or near aspen stands and other areas with trees or very tall shrubs; however, these habitats are not used with any consistency, and they may be areas of high predation. The spatial arrangement of the habitats is also important. Leks generally have taller sagebrush cover nearby, and leks and nesting habitat generally need to be in close proximity (although instances of leks being separated from nesting habitat by long distances have been documented). Early brood habitat and nesting habitat should also be in close proximity to one another. Meadows need nearby sagebrush cover to provide the escape cover and loafing cover during summer. The variety of height and cover classes of sagebrush used for winter should also be intermixed.

Therefore, sage grouse habitat, when considered over the period of a year, consists of a variety of habitats or habitat conditions. A mosaic of these habitat types or conditions must be available on the landscape to provide all of the sage grouse seasonal cover and nutritional needs. The mere

presence of sagebrush alone, especially uniform stands over vast acreages, should not be considered quality sage grouse habitat. These stands may provide some seasonal habitat, but cannot provide all the habitat needs throughout the year.

Two leks have been documented in the west portion of Boone Springs Allotment, along with nesting and winter habitat. Sage grouse have not been documented in the other allotments in the Sheep Allotment Complex.

3.2.3.2 Environmental Consequences

3.2.3.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Raptors

No direct impacts to the raptor species were identified. Although golden eagles and ferruginous hawks occasionally nest on or near the ground, which would create potential for destruction of the nest by livestock, this would have to be considered a rare event, especially when sheep are the class of livestock. Most of the nesting takes place on cliffs and rock outcrops; areas not used by livestock. Short-eared owls commonly nest on the ground under dense shrubs or in dense bulrush stands. Burrowing owls nest in burrows. Both of these species may have some vulnerability to trampling of the nest by livestock, especially short-eared owls that nest near riparian areas. The other raptors nest on ledges, cliffs, trees, and other locations not likely to be impacted directly by livestock grazing.

The use of the rangeland habitats within the allotments by golden eagles, ferruginous hawks, Swainson's hawks, and prairie falcons, is primarily for foraging – hunting for prey. The sagebrush vegetation on the foothills and benches supports mountain cottontail and jackrabbit populations. Ground squirrel populations are also common in the sagebrush and transition zone between the sagebrush and salt desert shrub. Other prey, such as birds, snakes, and small rodents, are common within the allotments. Under this alternative, some reduction in the quality of habitat for prey species has occurred, especially in the sagebrush plant community where shrub density has been a cause of herbaceous plant decline due to competition and change in the fire ecology. The increase in shrub density and stature also makes it more difficult for raptors to capture prey. However, there is no evidence that the prey base is limiting the populations of these raptors. Similarly, some areas of white sage have also been impacted by historic grazing and have been replaced by non-native, invasive species and it is reasonable to assume that the prey base has declined. However, there has been no information that establishes a link between the prey base within the Sheep Allotment Complex and any regional raptor population trends. Even the data collected within the Sheep Allotment Complex (Goshute Mountains) by Hawkwatch International that shows regional population trends and includes resident as well a migrating individuals, does not provide insight into this issue.

For short-eared owls and long-eared owls, the indirect impacts through habitat alteration are more evident. These two species nest and forage in the riparian zones and meadows. Riparian areas that have been degraded through heavy to severe use, soil compaction, and loss of woody shrubs would not provide the nesting habitat or the prey species for these two owl species. The long-eared owl also uses the salt desert shrub community for foraging. Areas with abundant Indian ricegrass are likely to support kangaroo rats, which are important prey species for this owl. The impacts to riparian vegetation have been attributed primarily to wild horses, and under this alternative, impacts to the riparian habitats would continue.

Peregrine falcons were known to occur in the area, but have not been documented nesting in the area since 1960. Therefore, no direct or indirect impacts to this species are anticipated from this alternative.

Northern goshawks have been documented in the allotments. The high elevation woodlands represent potential habitat for this species. These

upper elevation areas are not generally used by the sheep during winter. Consequently, no direct or indirect impacts to northern goshawk are anticipated from this alternative. Flammulated owls also use the high elevation conifer woodlands, and impacts to this species from the livestock grazing are not anticipated.

The loss of native vegetation, through conversion to non-native, invasive species, such as cheatgrass and halogeton, represents a loss of prey habitat. Under this alternative, additional acreage of habitat loss is anticipated through continued and expanded bedding areas and other areas of concentrated use, with associated loss of prey populations.

Winter use of the residual grasses also has the potential to reduce the quality of early spring habitat for the prey species. Under this alternative, monitoring has indicated that utilization of the dried grasses is on average only 35 percent, leaving sufficient cover for many of the mammal and bird prey species.

Potential impacts to grass vigor would reduce the amount of seed production each year. Because many of the birds, rodents, and insects depend on seeds for all or part of their diet, long-term changes in grass species abundance or production would reduce the quality of the habitat for the prey species by reducing the abundance of food.

Sage Grouse

The only sage grouse habitat within the Sheep Allotment Complex occurs in the Boone Springs Allotment. Helicopter surveys were conducted on the east side of the Goshutes in the spring of 2005 to identify any additional leks within the Sheep Allotment Complex. No additional leks were observed, and no birds were in attendance at either of the know leks within the Boone Springs Allotment.

Livestock use in the Boone Springs Allotment has been from November 15 to March 31, annually. As with some of the raptor species, sage grouse nest on the ground, but nesting is not usually initiated until April or May. Therefore, no direct impacts in the way of nest mortality area anticipated under this alternative.

The livestock season of use corresponds with winter habitat use for sage grouse. During this time, sage grouse are on a diet consisting entirely of sagebrush leaves, with the exception of the end of March when sage grouse start to seek early emerging forbs. Due to the extent of the sagebrush community on Boone Spring Allotment, the browsing by sheep during this time is not likely to cause a shortage of forage for sage grouse.

Presence of the sheep and or the sheep herder in the vicinity of the leks during March may have an impact on the breeding activities. Sage grouse are likely to abandon the lek for the day if disturbed by large numbers of sheep, the herder, or the sheep dogs. This would only be a measurable impact if it occurred often enough to interfere with breeding or cause abandonment of the lek for the breeding season.

Winter use of the dormant grasses has the potential to remove residual cover within the sagebrush stands. This cover is considered an important component of sage grouse nesting habitat (Connelly et al. 2000). During this time of the year, sheep are primarily browsers, feeding on the leader growth of the shrubs. The monitoring data indicated that utilization of key grass species was less than 50 percent in most years and averaged about 35 percent. This would allow for residual cover in nesting habitat and the full spring growth of grasses would also be available in the nesting habitat due to the removal of livestock by March 31. Only limited grass growth occurs in these allotments before March 31, and sheep would still be foraging primarily on shrubs. Because the sheep would not be present when grass growth has produced substantial foliage, indirect impacts to sage grouse nesting habitat would be considered negligible.

Summer brood habitat, consisting of riparian vegetation adjacent to sagebrush cover may be the limiting factor for this allotment. Perkins

Spring is the primary spring on this allotment on public land. The exclosure fence is in disrepair and wild horse use of the spring has resulted in degradation of the habitat values for sage grouse. The higher elevation springs and associated drainages within the region represent potential brood habitat. However, impacts to the most of the riparian areas from hot season use by wild horses have degraded the spring areas. In addition, juniper encroachment of the sagebrush community at the higher elevations has altered this former sage grouse habitat to non-habitat status over large acreages.

3.2.3.2.2 Alternative 2 – Implement the Multiple Use Decision

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation and Use Areas within the allotments. An increase in shrub and grass vigor would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors. The rest of the Use Areas would also provide additional residual grass cover for small mammal and bird prey species during the spring. Seed production would increase over time, increasing the food base for prey species.

The rest and rotation among the use areas would also slow the spread of non-native, invasive species and the loss of native habitat for the prey species.

The implementation of the spring exclosures has potential to substantially improve habitat quality for the short-eared and long-eared owls (both nesting and foraging habitats), as well as foraging habitat for most of the other raptor species. Establishment of willows and other woody shrubs and/or trees in these exclosures would eventually provide nesting sites for Swainson's hawk. Improvement in the Indian ricegrass production would also increase kangaroo rat populations, which has potential to benefit long-eared owls.

The impact analysis for golden eagle, northern goshawk, ferruginous hawk, prairie falcon, peregrine falcon, burrowing owl, and flammulated owl would be similar to the analysis under Alternative 1.

Sage Grouse

Effects to sage grouse habitat under this alternative would be similar as those determined for Alternative 1 except for the reduction of impacts to the riparian area associated with the Perkins Spring exclosure within the Boone Springs Allotment. Improvement of the riparian vegetation would initially benefit sage grouse broods by providing a reliable source of green forbs and insects late in the summer. However, if woody vegetation establishes and dominates the site, sage grouse use of the spring is anticipated to decline. Sage grouse prefer open meadows, rather than shrub dominated riparian vegetation. The other springs for which exclosures are proposed are not near known sage grouse brood habitat; therefore, these range improvements are not likely to benefit sage grouse.

The rest and rotation among the Use Areas would improve the quality of nesting habitat for sage grouse by increasing the amount of residual cover of grasses in nesting habitats.

Presence of the sheep and or the sheep herder in the vicinity of the leks during March may have an impact on the breeding activities. Sage grouse are likely to abandon the lek for the day if disturbed by large numbers of sheep, the herder, or the sheep dogs. This would only be a measurable impact if it occurred often enough to interfere with breeding or cause abandonment of the lek for the breeding season.

3.2.3.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Raptors

Effects to raptors under this alternative would be similar as those determined under Alternative 2, except the benefits of the spring exclosures to

short-eared and long-eared owls would not occur. The riparian areas would continue to be impacted by wild horses, and habitat improvement for the two owl species would not occur. Potential for improvement of shrub and grass productivity in the upland areas would occur. This should result in a long-term benefit to prey species and indirectly to raptors.

Sage Grouse

Improvement in the riparian vegetation and potential brood habitat at Perkins Spring would not occur under this alternative. Benefits to sage grouse broods would not be realized.

The rest and rotation among the use areas would improve nesting habitat as described under Alternative 2.

Presence of the sheep and or the sheep herder in the vicinity of the leks during March may have an impact on the breeding activities. Sage grouse are likely to abandon the lek for the day if disturbed by large numbers of sheep, the herder, or the sheep dogs. This would only be a measurable impact if it occurred often enough to interfere with breeding or cause abandonment of the lek for the breeding season.

3.2.3.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Raptors

Effects to raptors under this alternative would be similar as those determined under Alternative 2. Overall improvement in the shrub and grass components of the habitat would be expected, with corresponding benefits to prey species.

The benefits to short-eared and long-eared owls would also occur through improvement of the riparian areas where spring exclosures would be constructed.

Sage Grouse

The proposed grazing for the Boone Springs Allotment under this alternative would permit grazing in Use Area A (i.e., north and west of the highway) during the month of March. This is the area in which the two leks, nesting, and most of the winter habitat occur. No direct or indirect benefit is anticipated for sage grouse, and there is potential for impacts due to the presence of the sheep, herder, and sheep dogs, as discussed above.

Reduction of residual cover of grasses could occur, but sheep would still be browsing shrubs until the soil temperature is sufficiently high to initiate grass growth.

3.2.4 Conservation/Mitigation Recommendations and Residual Impacts

3.2.4.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

No conservation or mitigation recommendations for vegetation have been made for Alternative 1. This alternative represents the system which was evaluated in the allotment evaluation process and Alternative 2 was developed to make the necessary changes required to meet rangeland health standards and allotment objectives.

Residual impacts would include heavy to severe use of the spring areas and potential for non-native, invasive species to establish at the spring sites and displace the riparian vegetation.

Residual impacts under this alternative include non-achievement of rangeland health standards for the upland sites. Shrubs and grasses would continue to suffer the effects of early spring defoliation, and non-native, invasive species would continue to spread throughout the allotments where livestock concentrate and where wild horse impacts occur.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact, primarily to short-eared owls, long-eared owls, and sage grouse, but prey for other raptors would also be affected by the continuing degradation of the spring areas by wild horses.

3.2.4.2 Alternative 2 – Implement the Multiple Use Decision

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas and the perimeter of the exclosures to detect and subsequently treatment of noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments. This mitigation measure should also be extended to sheep camp, sheep bedding, and watering sites used the previous winter.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the water troughs and bedding areas. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Mitigation under this alternative would include annual evaluation of the non-enclosed springs to determine if rangeland health standards for riparian areas are being met and treatment, as necessary, of non-native, invasive species. Inspection of the areas near the troughs would also be necessary to ensure non-native, invasive species do not establish at these sites and then spread to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation under this alternative would include avoiding soil disturbance (from grazing, location of water sources, and range improvements related construction) when the soils are moist which would reduce soil compaction. Locating water developments or concentrated use area on soils that are not as subject to compaction (such as gravelly soils), would reduce impacts.

Seasonal restrictions for grazing within a quarter-mile of the leks in Boone Springs Allotment (Use Area A) during the sage grouse breeding period would mitigate potential disturbance of sage grouse at the leks.

Residual impacts would include potential for non-native, invasive species to occur in areas of livestock concentration, such as bedding areas or at water sources. However, this potential would be less than under Alternative 1 due to the implementation of grazing Use Areas to move the livestock around the allotment and reduce repeated use of the same areas.

Residual impacts to riparian vegetation under this alternative would be limited to the non-enclosed spring areas. Wild horse use of these areas and potential for non-native, invasive species to establish on these areas would continue.

Residual impacts would occur at the spring exclosure for sage grouse if the exclosure vegetation becomes shrub or tree dominated. The value of this area would decline for sage grouse. Mitigation would include occasional, short-term grazing or other shrub treatment to keep the riparian area at least partially as a meadow complex for sage grouse broods.

3.2.4.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative non-native, invasive species would continue to establish at riparian areas associated with springs primarily as a result of wild horse use of these areas. Mitigation for the impacts would include annual inspections of the spring areas and treatment of noxious weeds as appropriate.

Mitigation would also include annual inspection of the spring areas and treatment, as necessary, of non-native, invasive species.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation under this alternative would include avoiding soil disturbance (from grazing, location of water sources, and range improvements related construction) when the soils are moist which would reduce soil compaction. Locating water developments or concentrated use area on soils that are not as subject to compaction (such as gravelly soils), would reduce impacts.

Residual impacts would include heavy to severe use of the spring areas and potential for non-native, invasive species to establish at the spring sites and displace the riparian vegetation.

Residual impacts would include continued degradation of the spring areas, primarily by wild horses during the hot summer months, and spread of non-native, invasive species.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact, primarily to short-eared owls, long-eared owls, and sage grouse, but prey for other raptors would also be affected by the continuing degradation of the spring areas by wild horses. Due to the proposed change in wild horse numbers, the impact would not be as great as under Alternative 1.

3.2.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas and the perimeter of the exclosures to detect and subsequently treatment of noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments. This mitigation measure should also be extended to sheep camp, sheep bedding, and watering sites used the previous winter.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the water troughs and bedding areas. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Mitigation under this alternative would include annual evaluation of the non-enclosed springs to determine if rangeland health standards for riparian areas are being met and treatment, as necessary, of non-native, invasive species. Inspection of the areas near the troughs would also be necessary to ensure non-native, invasive species do not establish at these sites and then spread to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation under this alternative would include avoiding soil disturbance (from grazing, location of water sources, and range improvements related construction) when the soils are moist which would reduce soil compaction. Locating water developments or concentrated use area on soils that are not as subject to compaction (such as gravelly soils), would reduce impacts.

Seasonal restrictions for no grazing within a quarter-mile of the leks in Boone Springs Allotment (Use Area A) during the sage grouse

breeding period would mitigate potential disturbance of sage grouse at the leks.

Monitor and quantify impacts from OHV recreation on burrowing owl habitats, particularly in areas of breeding concentration. Loss of burrowing owl nest sites could be mitigated by constructing burrows in suitable alternative habitats with attendant site protection.

Residual impacts to riparian vegetation under this alternative would be limited to the non-enclosed spring areas. Wild horse use of these areas and potential for non-native, invasive species to establish on these areas would continue.

Residual impacts would include potential for non-native, invasive species to occur in areas of livestock concentration, such as bedding areas or at water sources. However, this potential would be less than under Alternative 1 due to the implementation of grazing Use Areas to move the livestock around the allotment and reduce repeated use of the same areas.

Residual impacts would occur at the spring exclosure for sage grouse if the exclosure vegetation becomes shrub or tree dominated. The value of this area would decline for sage grouse. Mitigation would include occasional, short-term grazing or other shrub treatment to keep the riparian area at least partially as a meadow complex for sage grouse broods.

3.2.5 Cumulative Effects

3.2.5.1 Past Actions

During the period from 1860 to 1940 the perennial native grasses were greatly reduced and sagebrush and other shrub species increased in dominance (Young et al. 1979). With these historic levels of livestock use, the time, duration, and intensity of grazing exceeded the ability of the plants (both grasses and some shrubs) to maintain plant vigor through the constant removal of photosynthetic tissue and growing points at all times of the year. Winterfat was a semi-shrub species especially susceptible to season-long grazing and much of the range formerly occupied by winterfat was occupied by halogeton, a non-native, invasive species. By 1890, shrubs dominated most of the western rangelands (Young et al. 1979). By the early 1900s, the forest preserves were established, which were precursors to the national forests. As these forest preserves were established, restrictions were placed over the nomadic sheep operations and some relief of grazing intensity began.

Most of the early range improvements implemented by the BLM were designed to increase livestock forage and stabilize soils and actual results of these projects were mixed. Halogeton control was also an issue and crested wheatgrass, a non-native species was introduced as one means of replacing halogeton with a forage species. While there were benefits to prey species and sage grouse through the conversion from halogeton to perennial grasses, the non-native species and the monocultures that were produced had the immediate effect of creating non-habitat. As shrubs and native species established over time (30 or more years in many cases), the habitat values returned and many birds and small mammals, as well as sage grouse can be found in older seedings that have a mixture of sagebrush, native grasses and forbs, and crested wheatgrass.

In addition to the initial impact of grazing on the native grasses, a subtle but more profound and lasting effect of grazing was a change in the fire ecology of Great Basin rangelands. During the initial overstocking of the rangelands, grasses were grazed to the extent that there was insufficient fuel to carry lightning-ignited fires. In many instances the shrubs were too widely spaced for fires to burn large acreages. This reduction in natural fires allowed shrub species to increase in stature and density by eliminating the low to moderate intensity fires that formerly kept the rangeland open in more of a grass dominated or grass-shrub mixture. In the absence of these low to moderate fires, shrub dominance became common.

Cheatgrass, which was introduced in the late 1800s or early 1900s, began to expand into portions of the low elevation, low precipitation

zone vegetation. The presence of this species in these plant communities set the stage for conversion to annual grasslands in many sagebrush and salt desert shrub communities.

By the 1960s the shrub density was sufficient that the fine fuels (native grasses) were no longer needed to carry fires in much of the Great Basin rangelands, and large, shrub-fueled fires began to occur. Due to the intensity of these fires, most of the perennial species were destroyed and cheatgrass, which was present in the understory in limited amounts responded by dominating the burned area. This annual species has increased the frequency of fires where it exists, which prevents shrubs from re-establishing. Therefore, livestock grazing, in combination with introduced species and vegetation treatments have resulted in an altered fire regime. First increasing the fire return interval, allowing shrubs to increase in density and extent and allowing cheatgrass to establish, followed by decreased fire return intervals that allow cheatgrass to persist and dominate the sites.

Initially the shrub build up provided habitat for sage grouse, but as the understory grasses and forbs declined and shrubs dominated, the critical nesting, pre-laying, and early brood habitats declined in abundance. The fires that followed eliminated sage grouse habitat, as well as habitat for the prey species on which the raptors depend.

As indicated in the Allotment Evaluation (BLM 2000a) there have been at least 61 wildland fires documented on the Sheep Allotment Complex. However, these fires account for about one percent of the acreage within this complex. Approximately half of these fires occurred in the low sagebrush/salt desert shrub community. This community is not fire adapted, and the spread of cheatgrass into this community is one possible reason for the increase in wildland fire on the subject allotments.

The lack of fire during the mid-1900s up until the more recent increase in fires, allowed pinyon-juniper woodlands to expand into the sagebrush communities, especially the black sagebrush community. This expansion reduced the amount of sage grouse habitat, primarily along the foothills and benches. The expansion of the woodland community in canyons and along drainages also created unsuitable conditions for sage grouse to use these areas as summer brood habitat. The woodland is raptor habitat and sage grouse generally avoid wooded areas. The loss of sagebrush-bunchgrass communities also had potential to reduce cottontail and jackrabbit populations, two primary prey species for the larger raptors. Consequently, there was an increase in nesting habitat for some species of raptors, but a decline in foraging habitat for other raptor species.

Where sagebrush was not being replaced by pinyon-juniper, the competition between shrubs and grasses, as the shrubs increased in density and stature, created additional stress on the grass plants. The ability of shrubs to acquire soil moisture and nutrients is greater than the ability of grasses. Where grazing adds to the stress on grasses by reducing vigor and root growth, grass production is expected to be less. This has had an overall impact on the productivity of many range sites, which has likely resulted in less prey species through lower production of herbaceous forage and decreased seed abundance. Similarly, this loss of various age classes and structure of the sagebrush community has resulted in less pre-laying, nesting, and early brood habitat for sage grouse. Periodic treatment of the vegetation, combined with seeding native perennial grasses when necessary, would offset the change in fire ecology that has eliminated the low to moderate intensity fires that kept the sagebrush community productive.

As the non-native, invasive species, especially the annual grasses and forbs, become established on the allotments, the risk of developing a fire regime that favors these annual species increases. Any actions that create favorable conditions for establishment or promote seed dispersal contribute to this threat.

Although the construction of the railroad occurred before many of the non-native, invasive species

were introduced to the Great Basin, the construction did create disturbance that allowed native weedy species to establish and dominate the railroad right-of-way, borrow pits, gravel pits, and the railroad stations, like Shafter (water supply stops for the old steam engines). The Western Pacific railway currently extends through the north east portion of the Leppy Hills Allotment. The trains, especially the old steam engines, but even the modern day trains, cause wildland fire ignitions. These fires facilitate the establishment of cheatgrass in the salt desert shrub and sagebrush communities.

Similarly, Interstate 80 and Alternate Route 93 are travel ways for non-native, invasive species and increase the potential for man-caused fire ignitions. Only the Sugarloaf, Ferber Flat, and Utah/Nevada South allotments do not have one or the other of these highways within or adjacent to their borders. These two major highways also fragment the habitat by creating a physical barrier that may effect sage grouse movements.

The Graymont Western, U.S., Inc. currently operates the Pilot Peak Quarry (limestone) and has been conducting exploration drilling in the Leppy Hills Allotment. Approximately 520 acres of disturbance are associated with these activities. Most of this disturbance is in the salt desert shrub, sagebrush-bunchgrass, and pinyon-juniper vegetation.

The build up of wild horse populations within the HMAs has also contributed to the current condition of the springs and upland vegetation.

3.2.5.2 Present Actions

Impacts of the pre-MUD grazing were detailed in the BLM Allotment Evaluation (BLM 2000a) and summarized in the analysis in Section 3.2.1.1.3.2 above. Dispersed recreation, including hunting, OHV (Off Highway Vehicle) use, and BLM-authorized OHV organized events are responsible for the creation of new trails, which become pathways for non-native, invasive species. Creation of the trails impacts the established flora by physically damaging the plants, creating soil erosion, and creating competition between the native plants and the non-native, invasive species. These two land uses contributed to not meeting some of the rangeland health standards and some allotment-specific objectives, and impacts would continue.

Recent drought has also affected the productivity of the plants. Minimal leader growth on the shrubs was observed in recent years, resulting in voluntary non-use and BLM emergency drought closures of the allotments.

Wildlife habitat and the use of the habitat by wildlife were not identified in the allotment evaluation as contributing to the non-achievement of allotment objectives or rangeland health standards. In contrast, the use of certain habitats by wild horses did contribute to the non-achievement of objectives and standards.

The use of the Goshute Mountain monitoring site by Hawkwatch International has been subject to the conditions required for WSAs and has had minimal impact on the vegetation, raptors, sage grouse, or prey species.

3.2.5.3 Reasonably Foreseeable Future Actions

The continuation of grazing under Alternatives 2, 3, or 4 would be anticipated to improve the general condition of the range. Alternative 3 would not provide for improvement of the springs and riparian vegetation. Non-native, invasive species would be anticipated to continue to be present in the allotments, but the rate of increase is likely to be less under Alternatives 2 and 4.

Overall improvement of the habitat for sage grouse and raptor prey species is anticipated under Alternatives 2 and 4, and improvement of only the uplands is anticipated under Alternative 3.

Fire suppression and burned area emergency rehabilitation are likely to continue. This is likely to reduce the changes in the plant community due to large fires (i.e., fire suppression should limit the size of the fires), but also result in somewhat less diverse communities in the short-term (i.e., the

fire rehabilitation seed mixes generally only include a few species).

The acreage of habitat for prey species and raptor foraging is likely to be reduced by expansion of human occupation of private lands within the allotments near West Wendover, Nevada. These same allotments are likely to receive increased recreational use, which has potential to increase the abundance of non-native, invasive species.

Temporary loss of habitat due to mineral exploration and temporary and permanent loss of habitat due to mine development could reduce prey species and sage grouse populations, depending on the location and extent of the actions.

3.3 Big Springs Allotment

3.3.1 Vegetation Resources (Including Non-native, Invasive Species)

3.3.1.1 Affected Environment

The regulatory framework with respect to vegetation and non-native, invasive species is provided in **Appendix B**.

Three mountain ranges (Wood Hills, Pequop Mountains, and Toano/Goshute Mountains) which occur in the Big Springs Allotment are dominated by pinyon-juniper at the lower to upper elevations. On the Pequop and Toano/Goshute Mountains, white fir, limber pine, bristlecone pine, Englemann spruce, and curleaf mountain mahogany are present. The windswept ridges are occupied by either low sagebrush-bunchgrass or black sagebrush-bunchgrass, depending on the soil types. Mountain big sagebrush and other mountain shrubs are common in areas where pinyon-juniper has not encroached. The lower benches and foothills are primarily Wyoming big sagebrush-bunchgrass, but much of this potential plant community has either been replaced by pinyon-juniper or pinyon-juniper is present and increasing. The salt desert shrub community is common on the valley bottoms.

A noxious weed inventory of the Big Springs Allotment was conducted by the BLM in 1998. The survey has been supplemented with additional observations between 1998 and 2004. The following noxious weeds and invasive species occur within the allotment:

- Hoary cress;
- Scotch thistle;
- Canada thistle;
- Bull thistle
- Russian thistle;
- Halogeton;
- Blue mustard;
- Tumble mustard; and
- Cheatgrass.

Many of the non-native, invasive species occur only in small patches scattered around the allotment. Halogeton, a plant poisonous to livestock, has become less abundant in recent years. However, extensive areas of cheatgrass, blue mustard, burr buttercup, and tumble mustard occur within the allotment.

Relatively dense stands of cheatgrass are present on the east side of the Pequop Mountains, and a dense stand of cheatgrass occurs mixed with native vegetation just north of Interstate 80, associated with the East (Upper) Beacon Spring/Reservoir. Cheatgrass is also present in Payne Basin just south of Interstate 80 in the vicinity of Nanny Spring, and in an area on the east bench of the Pequop Mountains, just south of the Big Springs Ranch. These areas dominated by cheatgrass are likely the result of previous wildland fires, livestock grazing, and altered fire regimes.

Blue mustard has established on highly disturbed areas associated with stockwater locations, corrals, and other areas of livestock concentration. This species is also common in the undisturbed shrub ranges in Goshute Valley. Tumble mustard is also common in the desert shrub ranges in Goshute Valley and in the area of

the east Pequop bench that burned in the early 1990s.

3.3.1.2 Environmental Consequences

The Big Springs Allotments are used by cow/calf pairs, dry cows, and yearlings, wild horses, and wildlife. Grazing by domestic livestock is year-long within the allotments, but seasonal within any given pasture. The wild horses and wildlife are also present throughout the entire year. Cows are primarily grazers, feeding on the herbaceous forage during the growing season and dry grasses in the fall/winter. However, cows use browse (woody vegetation) during the summer, fall, and winter, transitioning to a mostly herbaceous diet in spring and early summer.

Although the term "range improvements" encompasses many types of actions, the range improvements proposed for the Big Springs Allotments include: wells/storage tanks, reservoirs, pipelines, seedings, fences, spring/riparian exclosures, spring developments, and noxious weed treatments.

3.3.1.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

The previous grazing permits for the Big Springs Allotment provided for a total of 21,983 AUMs apportioned as 16,598 AUMs within the East Big Springs grazing area and 5,385 AUMs within the West Big Springs grazing area. The allotment was under a year-long grazing system, with use distributed throughout the allotment by season.

Actual use during the period 1987 to 1999 for West Big Spring Allotment averaged 2,730 AUM, with a low of 458 AUMs and a high of 4,402 AUMS. For the East Big Springs Allotment the actual use ranged from 505 AUMs to 11,929 AUMS, with an average of 7,770 AUMs.

Plant Productivity

Under this alternative, three pastures would continue to receive fall/winter/spring use: Independence, East Pequop Bench, and Shafter. Actual use varied widely among years in each of these pastures, with a high use as much as ten times the reported low use (BLM 2000b, Big Springs Allotment Evaluation). Utilization at Key Areas exceeded 60 percent of key species in some years, and use pattern mapping indicated that in the Independence Pasture, moderate to heavy use occurred in the areas closet to water. These areas were used by livestock, wild horses, and wildlife and had year-round access to water. Similarly, the areas of highest use in the East Pequop Bench and Shafter pastures have been associated with water developments.

Under this alternative, it is anticipated that these same distribution and use patterns would continue in these fall/winter/spring use pastures. With continued moderate to heavy use in the areas adjacent to water sources, the potential is high for impacts to both grasses and shrubs in these areas. High levels of spring use after months of winter use would remove the growing points from the shrubs and grasses, depleting root reserves over time. The extent of the impact would depend on how much growing season moisture remains after the livestock are removed, and how much use occurs in these areas by wild horses and wildlife during the growing season. The remainder of the pastures, generally more than 50 percent of the pasture acreage, receives slight and light use. The bench areas in these pastures consist primarily of sagebrush-bunchgrass. Due to the high levels of sagebrush, competition between the sagebrush and the grasses is expected to result in a long-term suppression of grass biomass, even in the absence of heavy grazing.

The Holborn, East Squaw Creek, Payne, Six Mile, and Railroad Field pastures are generally used in spring and summer. Actual use has varied considerably among years in these pastures, by as much as a ten-fold difference between the highest and lowest actual use in Railroad Field. Use pattern mapping indicated that areas of moderate to heavy use occurred near the water sources. These pastures have received some rest from grazing which would be expected to facilitate recovery of root systems in some years.

Under this alternative, the heavy use areas are anticipated to experience a decline in grass plant vigor with a long-term decline in grass biomass. In areas of heavy browsing, a reduction in shrub productivity would be a long-term impact.

The North Pequop Mountain and Collar and Elbow pastures receive spring or summer to fall use. Utilization at Key Areas rarely exceeded 60 percent on key species in both of these pastures, except for use of white sage in Loray Canyon in Collar and Elbow Pasture (BLM 2000). Under this alternative, the repeated removal of herbage and growing points of white sage in Loray Canyon during the growing season, is anticipated to result in a long-term decline in plant vigor and biomass.

The Windmill and North of Home Ranch Field pastures receive variable periods and seasons of use. Impacts to grass and shrubs in these pastures would not likely create measurable effects as the plants are provided with opportunity to recover from herbivory. However, as with the other pastures in this allotment, the heavy use areas are likely to show some decline in vigor and production over time.

Range Improvements

The primary impact of the existing range improvements on vegetation under this alternative would be the continued concentration of livestock and wild horses at water sources. The instances of heavy and severe utilization were associated with the water sources – springs, seeps, troughs, wells, and water tank locations. The repeated use of the shrubs and grasses, especially at the heavy to severe level, results in very little replenishment of the carbohydrate reserves, which leads to decreased plant vigor and health over time. Repeated browsing of the shrubs removes the current year's growth and associated growing points, which stunts the plant growth and reduces productivity.

Non-Native, Invasive Species

The concentration of livestock at the water sources and riparian areas under this alternative would result in increased establishment and spread of non-native, invasive species. Initially, increases in the blue mustard, tumble mustard, cheatgrass, Russian thistle and halogeton are anticipated under this alternative. However, the noxious weeds are also present in the allotment and they are likely to establish on these sites and displace the annual weeds.

3.3.1.2.2 Alternative 2 – Implement the Multiple Use Decision

The grazing system proposed in the MUD is described in Section 2.4.2. The permitted livestock use of 16,963 AUMs under this alternative represents a reduction of 3,711 AUMs from Alternative 1. However, the 16,963 AUMs permitted under this alternative would be 6,463 AUMs above the average use recorded between 1987 and 1999. Period of use for the two allotments would be year-long with use spread out by pastures and seasons over the year (**Table 2-22 and Table 2-24**). Grazing within pastures would be by Use Areas, and within the individual pastures, the Use Areas would have specified periods of use and permit the implementation of deferred rotation systems for specific Use Areas. Wild horse AUMs would be reduced to 672 AUMs, or a reduction of 96 AUMs.

Plant Productivity

West Big Springs Allotment

The proposed grazing system under this alternative divides the Independence Valley Pasture into three major Use Areas. The use in these areas is set to rotate each year, except for the Boxcar Well Use Area, which would always receive late fall/winter use (December 1 to March 31). The other two Use Areas rotate between spring/early summer use (April 1 to June 30) and late summer/fall/winter/early spring use (September 1 to March 31). There are several minor use areas within the two major Use Areas, which are defined by water sources (**Table 2-22**). Under this alternative, grazing so as to not exceed the utilization objectives along with sufficient rest between the spring/early summer use the first year and the late summer/fall/winter/early spring use the second

year, would allow for shrubs and grasses to recover from the spring/early summer defoliation. The winter Use Area would be used the same time each year. The grasses would be dormant during this period of time and cows do not normally make much use of sagebrush, the major shrub in this Use Area. Winterfat is also present in this Use Area. Grazing so as not to exceed the utilization objective along with dormant season use is anticipated to have minimal impact on this half shrub. Impacts to grasses and shrubs are anticipated to be minimal. Due to the lack of fences between Use Areas, there is opportunity for livestock to drift out of the winter area if water becomes available in the other Use Areas due to precipitation events.

The Holborn Pasture would rotate between early use (May 15 to September 30) for two years and late use (July 1 to September 30) for two years. The early use would be late enough in the season so as to not defoliate the initial growth or growing points, which would allow carbohydrate production prior to grazing. During the rest of the growing season, elevated growing points could be removed, depending on the utilization level. The off date would allow for the cool season grass plants to experience fall growth and complete root growth and replacement. Some reduction in plant vigor would be expected due to the herbivory from spring into the dormant season, but the magnitude of this impact would depend on the intensity (utilization) level. At slight to light utilization, the effect would be minimal. At moderate to heavy utilization, some reduction in plant vigor is anticipated. However, this effect is likely to be offset by delaying grazing until the dormant season the following two years when the grasses would experience no early season use and there would be opportunity for fall season regrowth.

The effect on shrubs is likely to be greater than on grasses. Use during the late season (July 1 to September 30) when the grasses are dormant is likely to result in shrub use, as the growing shrub leaders would be more attractive. However, sagebrush is the major shrub in this pasture and cows do not generally use much sagebrush. Therefore, impacts to shrubs are anticipated to be minimal.

The effects on grasses would be similar in the North Pequop Mountain Pasture as are anticipated to occur in the Holborn Pasture. The two Use Areas within North Pequop Mountain Pasture would rotate between two years of early use (May 15 to September 30) and two years of late use (August 1 to September 30). Impacts to grasses over the long-term would be minimal. However, the North Pequop Mountain Pasture includes a mixture of sagebrush and bitterbrush. Livestock use of bitterbrush is likely to occur during both periods of use. Grazing so as not to exceed the utilization objectives along with the deferred rotation system is anticipated to have minimal impact on this shrub.

East Big Springs Allotment

The proposed grazing system under this alternative uses a deferred rotation system to rotate growing season rest for the grasses and shrubs. The large pastures are divided up into Use Areas to address issues of duration and intensity of herbivory.

The Shafter Pasture would always serve as the winter/early spring pasture with a yearly season of use of October 1 to April 15. Two Use Areas would be used each year to reduce the duration that livestock spend in any one area. When wet years occur, a third Use Area on the west side of the pasture would be used for late winter/early spring use. This third Use Area has insufficient water in normal or dry years to facilitate grazing. Due to the utilization level standards associated with this pasture, the movement between Use Areas, and the complete rest each year during the late spring through summer, effects of winter and spring defoliation of the grasses and shrubs is anticipated to be offset by the growing season rest. Duration would be controlled by the movement between Use Areas and utilization levels would be used to determine when livestock need to be moved. The use of the third Use Area in wet years would provide some winter relief in the other two Use Areas within this pasture.

Grazing in the East Pequop Bench Pasture would be deferred rotation during the growing season combined with late summer and fall use. The grazing would be divided among four Use Areas (**Table 2-25**) with grazing occurring during early spring (March 1 to May 15) in two Use Areas, during spring/summer (May 1 to July 15) in the other two Use Areas, and during fall/early winter (September 1 to December 31) in the seeding that also received early spring use, in years one and two. During years three and four, the dates would be reversed, with the two early spring Use Areas also receiving fall/early winter use and the other two Use Areas receiving spring/summer use. The system would allow sufficient growing season following the early spring use for grass plants to continue the growth cycle, following the initial defoliation. Fall and early winter use of these same areas would reduce the amount of fall root development and bud development from fall growth for two years, but the plants would have time to recover the following two years when spring and fall/winter use would not occur. The spring/summer use areas would have early season and fall regrowth periods to provide for growth cycle and root growth and replacement. Therefore, effects to grass plants would not be expected to result in long-term declines in grass productivity. The effects of fall/early winter use of shrubs would depend on the intensity of use. At slight to light utilization, the effect would be minimal. At moderate to heavy utilization, some reduction in plant vigor is anticipated. However, this effect is likely to be offset by having no early season use or fall use the following two years, and there would be opportunity for fall season regrowth. The utilization standards for willow and aspen would be used to prevent impacts to the shrub species.

Payne Basin would receive two years of growing season use (May 16 to September 30) followed by two years of summer dormant season (July 1 to September 30) use. Impacts under this system would be dependent on the intensity of use, as the duration and time of grazing occur during the growing season two out of four years. During the summer dormant season use, the utilization level on key species would be 50 percent. Both of these grazing periods allow for the fall regrowth/recovery period. Effects to shrubs (especially bitterbrush) are anticipated to occur under this system due to the timing of herbivory every year in the hot season, but effects would be minimal if the 40 and 50 percent utilization levels are not exceeded. Effects to grasses would also be minimal under this system due to the opportunity for the grasses to conduct growing season carbohydrate production during two out of four years and fall regrowth every year.

Grazing in Six Mile Canyon would be defined annually as determined by water availability. When water is available, this pasture would be used as an alternative to Payne Basin. Therefore, it is anticipated that the use would be early spring use in the years that use takes place, and livestock would be moved to Payne Basin when the water was no longer available. Utilization levels on key species would be 40 percent during the growing season use, if used during the critical growing season every year.

Grazing would be permitted in East Squaw Creek Pasture from April 1 to October 15 each year; however, the actual grazing periods would be coordinated such that the South Seeding Use Area would be grazed in the spring until approximately May 1 and then again in the fall from approximately September 30 to October 15. Use in the late summer/fall would be contingent on the level of use in the spring. The native portion of this pasture would be grazed during the same time frame as the South Seeding Use Area, but utilization monitoring would be used to determine if the use in this Use Area would be deferred until July 1 for two consecutive years out of four. The time of grazing under this system would allow defoliation of the grasses during the early spring growth and the fall regrowth periods, but would allow uninterrupted summer growth. The duration and intensity of grazing would be critical to this system, especially on the native range. Early spring growth would occur before the initial grazing period, allowing the development of leaf area on the grasses. Slight to light grazing during this period is not anticipated to remove the growing points, and the grasses would continue

growth when the livestock leave the pasture on or around May 1. Regrowth in the fall would be dependent on the weather in any given year. The potential is high for use of shrubs during the fall in dry years, when regrowth of grasses would be slight. However, the effects to shrubs are not anticipated to be great due to the short duration of grazing.

Two Use Areas in the North Pequop Mountain Pasture would allow deferment of growing season use two out of every four years. Livestock would use one Use Area from May 1 to July 31 and the second Use Area from July 1 to September 30 for two years, and then reverse the schedule for the next two years. This system would allow for initial growth in the spring and fall regrowth on one Use Area and spring/summer growth and fall growth on the other Use Area each year. This is anticipated to allow the grass plants to maintain vigor. Utilization of the shrubs during the late summer is anticipated under this system two of every four years. This is anticipated to reduce plant growth and vigor over the short-term if the utilization levels are exceeded, but is not anticipated to have long-term effects if there is compliance with the utilization levels.

The newly created Upper Squaw Creek Riparian Pasture would be rested until proper functioning condition is achieved, and then use would occur for up to three weeks between May 1 and July 31, with specific stubble height and utilization limits on herbaceous and shrub species, respectively. The limited duration and intensity would minimize effects to grasses and shrubs.

The Squaw Creek Ranch Field would be used as necessary as a riparian pasture for up to three weeks between May 1 and July 31 each year in conjunction with other spring/summer use pastures. This field would be used when utilization levels are being reached in other pastures, but limited to up to three weeks, dependent upon monitoring of riparian vegetation in this field. This pasture would also be subject to the herbaceous stubble height and shrub utilizations standards. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The Lower Squaw Creek Ranch Field would be used as necessary for up to three weeks between August 1 and October 31 each year in conjunction with other summer/fall use pastures. This field would be used when utilization levels are being reached in other pastures, but limited to up to three weeks, dependent upon monitoring of the irrigated meadow vegetation. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The Windmill Seeding Field could be used from April 1 to October 31. Normally it would be grazed during the spring/summer, but would be periodically deferred to the late summer/fall following dry years to allow a spring recovery period. This would limit effects to the seeded species in this pasture.

The Railroad Field pasture would be under a deferred rotation of summer/fall use for two years followed by spring/summer/fall use the following two years. The use would not occur over the entire use period, but would be determined annually. During the summer/fall use, the grass plants would be able to complete their growth cycle, but there would be potential for reduction of the fall carbohydrate production due to the timing of the grazing. Grazing this pasture to the moderate level would not be anticipated to cause any long-term effects to the grasses. Heavy to severe grazing would result in the inability of the plants to complete root growth and bud development necessary to initiate spring growth and may remove growing points necessary for spring growth. The limitation on the actual period of use (duration) when the pasture is used for the spring/summer/fall would allow either growing season recovery or fall recovery of the plant vigor. Similarly, the intensity (utilization) level would limit impacts to grasses. At slight to light levels of utilization, impacts to vigor of grasses are not anticipated.

The Collar and Elbow Pasture would be used after weaning for late summer/fall/early winter use

(August 15 to January 31) each year. The annual use during this period is anticipated to result in herbivory of the shrubs, which would be limited by the utilization standards. Similarly, the use would occur during the fall regrowth period for the cool season grasses and utilization standards would limit the effect. Exceedence of the utilization standards for shrubs and grasses would likely cause long-term effects to plant productivity and vigor.

North of Home Pasture includes the Source Water Area Protection Zone for the spring source portion of the water supply to West Wendover, Nevada. Use in this pasture would be generally limited to trailing between pastures. However, some seasonal use may be made of this pasture to accommodate movement of livestock when utilization levels are reached in other pastures. Under these conditions, utilization standards would limit the amount of herbivory in this pasture to allow for adequate summer and fall regrowth. Effects to grasses and shrubs in this pasture are not anticipated.

Range Improvements

West Big Springs Allotment

Four water developments, two seedings, fencing, and spring developments/exclosures are proposed for the West Big Springs Allotment under this alternative (**Table 2-23**) to facilitate implementation of the grazing system. The water developments are anticipated to improve livestock distribution to reduce potential impacts to grasses and shrubs in areas currently receiving moderate to severe utilization. As indicated in the Allotment Evaluation (BLM 2000b), much of the area in the pastures in this allotment receives slight to light use. Providing additional water sources in these areas would allow the permittee to control livestock movements to improve the duration and intensity of herbivory in the pastures/Use Areas. However, the water developments would also create new areas of concentration, which would be used for shorter duration than the areas associated with the current water sources. Therefore, there would be an overall beneficial effect from the water developments.

Depending on edaphic conditions and the objectives of the seeding, the seed mix may include non-native species. The two seedings would occur in sagebrush areas that are currently in poor condition with very little herbaceous understory in the Independence Valley Pasture and Holborn Pasture. The seedings would be associated with existing water developments, which under the previous grazing, created livestock concentrations that led, in part, to the depletion of the herbaceous component of the sagebrush habitats. The impact of these seedings on the native vegetation would depend on the species included in the seed mix. The seed mix is only generally described in the MUD as consisting of “forage grasses, shrubs/half-shrubs, and forbs” (Final MUD, pages 11 and 12). A seed mix containing all native species suited to the site would have less impact than a seed mix with non-native species (e.g., crested wheatgrass, forage kochia, or sainfoin). A native seed mix would result in a short-term impact due to the loss of the shrub component until the seeded shrubs establish and provide structure to the seeding. It is also likely that a native seeding would have equal or greater diversity of plants compared to the current poor condition stand. Other adjacent native forbs and grasses may also establish within the seeding, further increasing plant diversity.

If non-native species are used in the seed mix, the effect would depend on the aggressiveness (i.e., competitive advantage) of the non-native species with respect to available native species. Crested wheatgrass and other species/varieties of introduced wheatgrasses are quite competitive with native bunchgrasses. This species is likely to persist on the site and may prevent or retard the colonization of the seeding by native species. Similarly, forage kochia, while not thought to be an aggressive species (Harrison et al. 2000), would prevent other native species from establishing simply because it would already occupy the site.

The proposed boundary fence and drift fences would result in some short-term disturbance of the native vegetation during construction. However the overall effect on the existing vegetation would be to control livestock movement and prevent livestock grazing impacts due to time, duration, or intensity of herbivory on the vegetation.

The unspecified spring developments and exclosures would result in water sources being available away from the spring source and located in upland vegetation. The effect would be to allow riparian areas to re-emerge at their original locations or otherwise improve at their existing locations with continuing livestock impacts to the adjacent upland areas.

East Big Springs Allotment

Five water developments/tanks, four pipeline projects, three seedings, eleven or more spring/riparian developments/exclosures, fencing, and noxious weed treatments are proposed for the East Big Springs Allotment under this alternative (**Table 2-26**) to facilitate implementation of the grazing system. The effects of the water developments, one of the seedings, spring/riparian developments/exclosures, and fencing would be similar to the discussion of these types of range improvements discussed above for the West Big Springs Allotment.

The impacts of the pipeline projects would be short-term disturbance of the existing vegetation during construction and until the vegetation re-established on site.

The impact of the Oasis Seeding in the East Pequop Bench Pasture would be to replace cheatgrass and tumble mustard with more productive species and species with less potential for wildfire ignitions. The impact would be determined by the species selected for the seed mix, as described for above for the West Big Springs Allotment. The success of a native species seeding would depend on the ability to control the non-native, invasive species at the time of seedbed preparation and seed germination. A seed mix with desirable non-native species is likely to be more successful in the presence of the existing non-native, invasive species.

The impact of the East Squaw Creek Pasture seeding would be replacement of 1,200 acres of native range with “desirable forage grasses and forage kochia” (Final MUD, page 21). The impact would depend on which desirable forage grasses are included in the seed mix. As discussed above for the seeding projects proposed for the West Big Springs Allotment, the use of non-native grasses would have impacts to the native vegetation in the proposed seeding. The resulting vegetation would provide forage for livestock and big game, and would provide a reserve of forage in dry years.

Non-Native, Invasive Species

West Big Springs Allotment

The grazing system proposed under this alternative would reduce the level of impact to vegetation at water sources and in native pastures as compared to the existing system. This would slow down the spread of non-native, invasive species and keep them as a minor component of the plant community. Any areas that receive high utilization levels create seedbed conditions that allow non-native, invasive species to readily establish. Once established at these sites, the non-native, invasive species can colonize other sites when conditions are suitable, regardless of the utilization levels. Therefore, the overall affect of the grazing system would be to reduce “entry points” for non-native, invasive species.

The proposed range improvements facilitate achieving the objectives of the grazing system; therefore there is a beneficial aspect to the range improvements. The wells would improve distribution and provide water to support the livestock when they are allowed to only occupy a portion of the range. However, there is also the likelihood that livestock concentrations would occur at the new water sources, depending on

the time and duration of the grazing at these new sources. Due to the change in the grazing system under this alternative, the time and duration of grazing should be appropriate to limit the intensity of grazing at the proposed water sources. Even though the net result of the water developments and grazing system may be less area in the heavy and severe utilization categories, there would be more locations (but smaller in size) where the concentration of livestock would occur, and thus more entry points for non-native, invasive species.

Similarly, the fences would have the affect of reducing livestock grazing effects on the vegetation, but the surface disturbance associated with the construction of the fences would provide potential sites of establishment for non-native, invasive species. In addition, the drift fence may direct livestock movements, rather than just contain the animals in the pasture. Therefore, the repeated trailing of livestock along the fence could create potential for non-native, invasive species establishment.

The proposed seedings also include potential for non-native, invasive species establishment. The establishment of seeded species is generally not uniform within the seeded area and the surface disturbance associated with removing the existing vegetation and seeding of the new species would create seedbed conditions suitable for non-native, invasive species. Cheatgrass, Russian thistle, and tumble mustard are three species that are likely to establish in the seeding. Other noxious weeds already present within the allotment (e.g., Scotch thistle, Canada thistle or bull thistle) could also establish in the seedings. These species would displace native or seeded species, impacting the overall productivity of the site for the short-term and long-term.

The riparian/spring exclosures would allow riparian vegetation to reestablish on the sites currently dominated by non-native, invasive species such as blue mustard and Russian thistle. For some of the other more aggressive non-native, invasive species, the construction of an exclosure to eliminate livestock impacts would not be sufficient to eradicate the invasive species (e.g., hoary cress), thus weed control treatments may be necessary.

East Big Springs Allotment

The effects of the water developments, seedings, riparian/spring exclosures, and fences in the East Big Springs Allotment would be similar to the effects described above for the West Big Springs Allotment.

The proposed noxious weed treatments under this alternative would result in a reduction of noxious weed infestations on the allotment, especially if the treated areas are also seeded following successful eradication of the noxious weeds. Reduction of the noxious weed infestations would also reduce the potential seed production, and therefore, the potential for new infestations to establish at new locations.

The construction of pipelines would result in surface disturbance that would create suitable seedbed sites for non-native, invasive species. Cheatgrass, halogeton, and Russian thistle are likely to establish on the sites, and several of the noxious weeds, such as Scotch thistle or Canada thistle, also have potential to establish along the pipeline route. Weed control treatments may be applied to control these species.

3.3.1.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the permitted livestock use of 15,808 AUMs represents a reduction of 6,175 AUMs from Alternative 1. However, the 15,808 AUMs permitted under this alternative would be 5,308 AUMs greater than the average use recorded between 1987 and 1999. The grazing system would be modified to provide deferred use or rotation with rest in all pastures with spring/riparian habitats and the vegetation treatments would not be implemented.

Plant Productivity

West Big Springs Allotment

The effects to vegetation within the Independence Valley Pasture would be reduction of fall carbohydrate production and bud development, and reduction of spring growing season carbohydrate production for the cool season grasses. The nine months of use in this pasture would be distributed among several use areas, so there would be some opportunity for recovery from either the fall or spring use.

The effects to vegetation in the Holborn Pasture would be a reduction in photosynthetic activity during a portion of the growing season every other year. The grazing would be initiated late enough in the spring to allow initial growth and growing point elevation. This pasture would also receive late summer use every year during the dormant period. The rest rotation of spring use combined with deferred use each year would allow grasses to maintain their vigor.

Little to no improvement in the sagebrush/rabbitbrush vegetation near the water source in this pasture would occur due to the elimination of the proposed seeding. The grazing system would provide some potential for grasses to recover from herbivory, but the intensity of use at the water site is likely to negate any long-term positive plant recovery. In addition, the sagebrush and rabbitbrush dominance of the site results in shrub-grass competition for nutrients and moisture. Therefore, grass vigor at the water site is not expected to improve under this alternative.

Under this alternative, the North Pequop Mountain Pasture would be split, with all of the riparian habitat in the newly created West Squaw Creek Riparian Pasture. This pasture would be rested every other year and receive only growing season use in alternate years. This would allow adequate recovery of root systems and growing point development. Grazing would be deferred until late in the growing season on the remaining portion of the North Pequop Mountain Pasture. The near complete growing season rest would allow grasses to complete their growth cycle and complete annual root growth and replacement. Annual hot season use of shrubs, such as bitterbrush, has the potential for long-term impacts if utilization levels are exceeded.

East Big Springs Allotment

The effects on grasses and shrubs in the Shafter Pasture would be as described above for Alternative 2; the effects of fall/winter and spring defoliation of the grasses and shrubs is anticipated to be offset by the growing season rest. Duration would be controlled by the movement between Use Areas and utilization levels would be used to determine when livestock need to be moved. The use of the third Use Area in wet years would provide some winter relief in the other two Use Areas within this pasture.

The East Pequop Bench Pasture would receive growing season use annually. This pasture has several seedings (crested wheatgrass), which generally tolerate growing season use. This species also has good fall greenup. In addition, the movement of livestock between the seedings during the grazing period and fall greenup should maintain the grass vigor. Utilization of shrubs under this system is anticipated to be slight to light, as grazing would occur when herbaceous forage is green and succulent.

The effects on vegetation in Payne Basin Pasture would be improvement in the vegetation. The alternating rest following growing season use would allow plants to recover from the effects of herbivory. Effects to shrubs and grasses would be minimal under this system due to the opportunity for the grasses to conduct growing season production every other year and fall regrowth every year.

East Squaw Creek, Railroad Field, and Windmill pastures would all receive late growing season to dormant season use annually. This would provide sufficient growing season carbohydrate production to complete root growth and replacement with very little interruption in plant growth.

The portion of the North Pequop Mountain Pasture in the East Big Springs Allotment would be divided into a riparian pasture (East Squaw Creek Riparian Pasture) and the upland portion of North Pequop Mountain Pasture. The riparian pasture would rotate between complete rest and growing season use. The North Pequop Mountain Pasture would be used late in the season, to defer grazing from the growing season. Grass and shrubs are anticipated to improve in plant vigor in both pastures.

The effects to vegetation in the Squaw Creek Ranch Field would be as described above for Alternative 2. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The effects to vegetation in the Lower Squaw Creek Ranch Field would be as described above for Alternative 2. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

The effects to vegetation in the Collar and Elbow Pasture would be as described above for Alternative 2. The annual use during this period is anticipated to result in herbivory of the shrubs, which would be limited by the utilization standards. Similarly, the use would occur during the fall regrowth period for the cool season grasses and utilization standards would limit the effect. Exceedence of the utilization standards for shrubs and grasses would likely cause long-term effects to plant productivity and vigor.

The effects to vegetation in the North of Home Pasture would be as described above for Alternative 2. Effects to grasses and shrubs in this pasture are not anticipated.

Range Improvements

West Big Springs Allotment

Four water developments and fencing are proposed for the West Big Springs Allotment under this alternative (**Table 2-28**) to facilitate implementation of the grazing system. The water developments are anticipated to improve livestock distribution to reduce potential impacts to grasses and shrubs in areas currently receiving moderate to severe utilization. As indicated in the Allotment Evaluation (BLM 2000b), much of the area in the pastures in this allotment receives slight to light use. Providing additional water sources in these areas would allow the permittee to control livestock movements to improve the duration and intensity of herbivory in the pastures/Use Areas. However, the water developments would also create new areas of concentration. The effect would be to continue livestock concentrations already located adjacent to the springs. Livestock trailing around the proposed exclosure fences may increase the area of disturbance. However, there would be an overall beneficial effect from the water developments.

The proposed boundary fence and drift fences would result in some short-term disturbance of the native vegetation during construction. However the overall effect on the existing vegetation would be to control livestock movement and prevent livestock grazing impacts due to time, duration, or intensity of herbivory on the vegetation.

East Big Springs Allotment

Five water developments/tanks, four pipeline projects, fencing, and noxious weed treatments are proposed for the East Big Springs Allotment under this alternative (**Table 2-28**) to facilitate implementation of the grazing system. The effects of the water developments and fencing would be similar to the discussion of these types of range improvements discussed above for the West Big Springs Allotment.

The impacts of the pipeline projects would be short-term disturbance of the existing vegetation during construction and until the vegetation re-established on site.

Non-Native, Invasive Species

West Big Springs Allotment

The grazing system proposed under this alternative would reduce the level of impact to vegetation at water sources and in native

pastures as compared to the existing system. This would reduce the potential for establishment and spread of non-native, invasive species by reducing the amount of acreage in the heavy and severe utilization categories. Areas that receive these high utilization levels create seedbed conditions that allow non-native, invasive species to readily establish. Once established at these sites, the non-native, invasive species can colonize other sites when conditions are suitable, regardless of the utilization levels. Therefore, the overall affect of the grazing system would be to reduce "entry points" for non-native, invasive species.

The proposed range improvements facilitate achieving the objectives of the grazing system; therefore there is a beneficial aspect to the range improvements. The wells would improve distribution, which reduces the amount of utilization occurring at the existing water sources. However, there is also the likelihood that livestock concentrations would occur at the new water sources, depending on the time and duration of the grazing at these new sources. Due to the change in the grazing system under this alternative, the time and duration of grazing should be appropriate to limit the intensity of grazing at the proposed water sources. Even thought the net result of the water developments and grazing system may be less area in the heavy and severe utilization categories, there would be more locations (but smaller in size) where the concentration of livestock would occur, and thus more entry points for non-native, invasive species.

Similarly, the fences would have the effect of reducing livestock grazing effects on the vegetation, but the surface disturbance associated with the construction of the fences would provide potential sites of establishment for non-native, invasive species. In addition, the drift fence may direct livestock movements, rather than just contain the animals in the pasture. Therefore, the repeated trailing of livestock along the fence would create potential for non-native, invasive species establishment.

East Big Springs Allotment

The effects of the water developments and fences in the East Big Springs Allotment would be similar to the effects described above for the West Big Springs Allotment.

The proposed noxious weed treatments under this alternative would result in a reduction of noxious weed infestations on the allotment, especially if the treated areas are also seeded following successful eradication of the noxious weeds. Reduction of the noxious weed infestations would also reduce the potential seed production, and therefore, the potential for new infestations to establish at new locations.

The construction of pipelines would result in surface disturbance that would create suitable seedbed sites for non-native, invasive species. Cheatgrass, halogeton, and Russian thistle are likely to establish on the sites, and several of the noxious weeds, such as Scotch thistle or Canada thistle, also have potential to establish along the pipeline route. Weed control treatments may be applied to control these species.

3.3.1.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, the permitted livestock use of 14,472 AUMs represents a reduction of 7,511 AUMs from Alternative 1. However, the permitted use of 14,472 under this alternative would be 3,972 AUMs greater than the average use recorded between 1987 and 1999. The grazing system under this alternative would eliminate the spring and summer use in the North Pequop Mountain Pasture with deferred rotation in the East Pequop Bench and Independence Valley pastures. Payne Basin Pasture would receive spring use every other year, and rested in the off years. All other pastures would be in deferred use. Most of the creek and spring exclosures proposed under Alternative 2 would not be constructed, but protection fences for the seedings would be constructed as needed.

Plant Productivity

West Big Springs Allotment

Grazing in the Independence Valley Pasture would be divided up among the nine Use Areas, defined by water sources (**Table 2-22**), during the late fall to mid-July. The areas would be divided such that deferment of fall/winter use with spring/summer use every other year. The effects on the grass species would be some reduced productivity in the Use Areas receiving spring/summer use, but the plants would receive a period of fall recovery followed by full growing season of deferment before fall/winter use. The Use Areas with fall/winter use in year one would receive a full growing season and fall/winter rest before being used in the spring/summer. Therefore, all grass plants would receive a recovery period to complete their growth cycle, complete root growth and replacement. Shrubs would also receive ample recovery periods between periods of use.

Grazing in the Holborn Pasture would be primarily during the summer (July 15 to September 14) each year with limited additional late fall use (November 1 to November 15) as livestock move through the pasture to return to the Independence Valley Pasture. This system would allow cool season grasses a full season of growth before use, and a portion of the fall regrowth before the late fall use.

The North Pequop Mountain Pasture would receive late summer/fall (September 15 to October 31) use each year. The grasses would receive a full spring/summer growing season of rest each year. Therefore, the grasses should not exhibit any reduced vigor or productivity. Shrub use during this time would be anticipated.

Although the time, duration, and intensity of grazing proposed for the West Big Springs Allotment under this alternative is not anticipated to create any measurable short-term impacts to grasses or shrubs, there is potential for long-term changes in species composition in the pastures. Because the proposed system under this alternative repeats the same season of use and duration of use in the three pastures, there is potential for livestock to demonstrate forage selection preferences, or select the same set of forage plants each year. Therefore, even though the proposed system provides for year-round grazing on the allotment with recovery periods for the grasses and shrubs, some plant species are likely to receive more and repeated use under this alternative which would create a competitive advantage for the "under-utilized" species. A long-term shift in species composition would be anticipated under this system. The time frame for noticeable change is likely to be decades, but pastures with already limited forage diversity may demonstrate these changes in only a few years. Variation in the annual timing and amount of precipitation and plant phenology may be sufficient to offset this "selective pressure."

East Big Springs Allotment

The late fall/winter/spring grazing in the Shafter Pasture would be divided primarily among two Use Areas with different periods of use. Consequently, the one Use Area would receive late fall/winter use and the other Use Areas would receive late winter/spring use. The effects of late fall/winter or late winter/spring defoliation of the grasses and shrubs is anticipated to be offset by the growing season rest. Duration would be controlled by the movement between Use Areas and utilization levels would be used to determine when livestock need to be moved. The use of the third Use Area in wet years would provide some winter relief in the other two Use Areas within this pasture.

A portion of the East Pequop Bench Pasture that was burned in 2000 would be deferred until June 6 each year and used through the summer months every year. The rest of the pasture would be used in early spring in years one and three and late spring through summer in years two and four. The grasses would receive some early spring and growing season rest each year as well as fall regrowth rest. Therefore, effects to grass productivity are not anticipated. Use during the summer dormant period for grasses would result in some shift in grazing to the shrubs. However, movement of the livestock among the four use

areas in this pasture would limit any impacts to shrubs.

Grazing in the Payne Basin Pasture would occur in spring/early summer and alternate with complete rest every other year. This would allow for recovery of the effects of herbivory and no impact to grasses is anticipated. The cessation of grazing before the hot season and the complete rest every other year would limit use on shrubs to the slight or light level.

The East Squaw Creek Pasture and Windmill Seeding Pasture would be grazed every year during the hot season (August 15 to September 15). The seedings in both pastures, and the native portion of East Squaw Creek Pasture would receive complete growing season rest and rest during the fall regrowth period. The grasses would have an opportunity to complete root growth and replacement and complete their growth cycles each year.

The North Pequop Mountain Pasture would not be grazed until early fall (September 15 to October 31) each year. This would avoid growing season use of the grasses, but would have potential to reduce fall regrowth, depending on the utilization levels. Shrubs would receive some use during this period, but the duration is relatively short. Impacts to the grasses and shrubs are not anticipated if the utilization levels are followed.

Railroad Field is a large sagebrush-bunchgrass pasture that would receive use every year between July 1 and September 30. Impacts to grasses would be limited due to the dormant season use and rest during the fall regrowth period.

Collar and Elbow Pasture would be grazed in fall/winter (September 1 to January 31). Potential exists for use during the fall regrowth period, which could reduce the number of new buds for spring growth. The grasses would have the entire growing season to complete their growth cycle. Some use of the shrubs is anticipated during this time period, especially winterfat. The utilization level limits for winterfat, combined with the growth habitat of this species, should limit impacts to winterfat and other shrubs.

The Lower Squaw Creek Ranch Field would be used as necessary for up to three weeks between August 1 and October 31 each year in conjunction with other summer/fall use pastures. This field would be used when utilization levels are being reached in other pastures, but limited to up to three weeks, dependent upon monitoring of the irrigated meadow vegetation. Due to the limited duration and intensity of use in this field, effects to plants are not anticipated.

North of Home Pasture includes the Source Water Area Protection Zone for the spring source portion of the water supply to West Wendover, Nevada. Use in this pasture would be generally limited to trailing between pastures. However, some seasonal use may be made of this pasture to accommodate movement of livestock when utilization levels are reached in other pastures. Under these conditions, utilization standards would limit the amount of herbivory in this pasture to allow for adequate summer and fall regrowth. Effects to grasses and shrubs in this pasture are not anticipated.

The proposed grazing system for the East Big Springs Allotment under this alternative repeats the time and duration of use in most of the pastures each year. As discussed above under the West Big Springs Allotment, there is potential for this system to cause long-term species composition changes in the pastures. The less palatable species are likely to increase and the more palatable species are likely to decrease in abundance. Variation in the annual timing and amount of precipitation and plant phenology may be sufficient to offset this “selective pressure.”

Range Improvements

West Big Springs Allotment

Under this alternative three miles of boundary fence proposed under Alternative 2 would not be constructed. All of the other range improvements proposed for the West Big Springs Allotment

under Alternative 2 would be constructed under this alternative. In addition, either temporary or permanent seeding protection fences would be constructed as needed and determined through monitoring.

The impacts to vegetation would be similar to the impacts described for Alternative 2, except that livestock drift between the two allotments in the North Pequop Mountain Pasture would not be controlled by fencing. This would result in potential for livestock from both allotments to drift and concentrate where water or forage is available, with probable exceedence of the utilization levels in these areas of concentration.

The new water sources would be expected to reduce impacts at the few existing water sources and create some new, but smaller areas of impact.

The seeding fences would allow the new seedings to establish without livestock use, and then be used as necessary to control the time and duration of livestock use of the seedings.

East Big Springs Allotment

Under this alternative nine spring exclosures, 7.5 miles of fence (boundary and pasture fence), and four miles of pipeline as proposed for Alternative 2 would not be constructed. Impacts to vegetation would be similar to those impacts described under Alternative 2 above, except that direct impacts to vegetation would be less because of the reduced surface disturbance associated with the reduced fencing and pipelines under this Alternative.

Non-Native, Invasive Species

West Big Springs Allotment

The proposed grazing system under this alternative is anticipated to result in short-term improvements in the vegetation by reducing grazing time, duration, and intensity on the desirable plant species. Maintenance of plant vigor and plant stocking in native plant communities is one means of reducing potential for non-native, invasive species invasion. Therefore, the grazing system should result in less susceptibility of the native vegetation to establishment of non-native, invasive species. Species such as halogeton, Russian thistle, and tumble mustard, which can be out-competed by existing native vegetation would likely decline in abundance and distribution. Other, more aggressive species, such as cheatgrass, Canada thistle, and bull thistle, would require additional measures to eradicate existing infestations.

The range improvement projects proposed under this alternative all require some surface disturbance to construct, and the water source projects would result in some concentration of livestock. As described under Alternative 2, these activities have potential to create sites where non-native, invasive species can establish, especially if constructed near existing infestations. These additional water sources reduce livestock concentrations at the existing water sources, which should reduce potential for non-native, invasive species, but would also create new areas of concentration. The extent to which the concentrations occur, and their impacts to vegetation at the sites, would determine the potential for establishment of non-native, invasive species.

East Big Springs Allotment

As discussed above for the West Big Springs Allotment, the proposed grazing system would improve plant vigor and plant stocking in the native plant communities. This would reduce the potential for non-native, invasive plant establishment within the allotment. However, the new water sources, pipelines, seedings, and fencing would create seedbed conditions suitable for establishment of these undesirable species.

The elimination under this alternative of the nine spring exclosures is likely to allow for additional non-native, invasive species establishment. Concentrated livestock use at the spring sites creates conditions suitable for blue mustard, cheatgrass, hoary cress, perennial pepperweed, and other non-native, invasive species. These sites then become sources for seed dissemination throughout other portions of the

allotment. Therefore, even with the proposed noxious weed treatments, non-native, invasive species are anticipated to increase on the allotment under this alternative.

3.3.2 Wetland/Riparian Zones

3.3.2.1 Affected Environment

The regulatory framework with respect to wetland/riparian zones is provided in **Appendix B**.

Riparian habitat on public lands is limited in the Big Springs Allotment. Most of the riparian habitat on public lands is located within the Pequop Mountains, north of Interstate 80. The largest riparian system is the East Squaw Creek drainage. Additional springs are located in the West Squaw Creek drainage, and scattered within the North Pequop Mountain area. Most of the water sources on public lands within the remainder of the allotment are seeps.

The riparian zones on public lands primarily consist of meadow grasses, sedges, and rushes. However, many of the water sources have been developed with all of the water piped to troughs. Consequently, the riparian vegetation at the source areas is minimal to non-existent. There are also some riparian areas within the allotment that support trees, such as aspen, alder, chokecherry, and willows.

Several large springs occur within the allotment on private lands. There are five wells on public lands and springs on private lands that are municipal water sources for the city of West Wendover, Nevada. The spring sources are located near the Big Springs Ranch and the wells are located south of the Shafter interchange off Interstate 80. All of these municipal water sources have a delineated water quality protection zone on public lands (Aqua Engineering 2000). The Source Water Protection Zones on public lands have no stockwater or livestock concentration areas.

3.3.2.2 Environmental Consequences

The Big Springs Allotment is used by cow/calf pairs, dry cows, and yearlings, wild horses, and wildlife. The livestock, wild horses, and wildlife are present throughout the entire year. The water sources are used by all of the animals during some part of the year, depending on the grazing system (livestock) and seasonal habitat use (wild horses and wildlife), and depending on the availability of the water.

With respect to riparian vegetation, cows are primarily grazers, using shrubs during the hot season, or during the fall and winter to finish the diet of dried grasses or hay. The use of riparian vegetation by livestock can occur in any season, but tends to receive concentrated use during the hot season (dormant season for upland, cool season grasses).

3.3.2.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Livestock grazing was one of the causal factors in not meeting some riparian allotment objectives and rangeland health standards. Continued use of the spring and seep areas under this alternative would impact vegetation due to the time, duration, and intensity of the grazing at these locations. Improvement of the riparian vegetation is not anticipated under this alternative. Potential for non-native, invasive species to establish at riparian areas would be high under this alternative.

The amount of water removed from spring sources also creates a long-term impact to the riparian vegetation. Without a spring development to remove the water, the spring creek flows from the spring and saturates the adjacent ground. The extent of this saturation zone depends on the amount of water exiting the spring and the gradient below the spring. The riparian meadow and/or shrub vegetation that develops is dependent on this annual wetting cycle and extended growing season moisture. When the

spring is developed, the area of meadow or shrub vegetation is reduced as the area of saturation is reduced. When all of the water is collected and removed, or stored in reservoirs, the riparian value of the spring is virtually eliminated. This occurs at the Moor Summit Spring/Seep, Beacon Springs/Reservoirs, Rocky Point Spring, Pequop Spring, Baker Spring/Pipeline, and Pencil Lead Spring.

3.3.2.2.2 Alternative 2 – Implement the Multiple Use Decision

Under this Alternative, eleven or more spring/riparian areas in the East Big Springs Allotment and an undetermined number of springs in the West Big Springs Allotment would be protected by construction of exclosures and development of water troughs outside the exclosures. Livestock use of the riparian vegetation associated with these springs would be eliminated. The spring and riparian vegetation would return to functioning condition. Other springs for which exclosures are not specifically proposed would be evaluated and if they continue to be impacted, then additional exclosures or changes in livestock management would be proposed.

The grazing system under this alternative provides hot season rest, growing season rest, or fall season rest through rotation or deferment of the North Pequop Mountain and Payne Basin, and pastures. These pastures contain the majority of the riparian zones. Duration and intensity would be limited within the pastures. In addition, the largest riparian system which is within the East Squaw Creek Riparian Pasture has specific stubble height, utilization objectives for riparian herbaceous and woody species (**Table 2- 25**). Consequently, improvement in the unfenced riparian areas is anticipated under this alternative.

These improvements in riparian area vegetation would reduce the potential for non-native, invasive species establishment and expansion within the allotments.

3.3.2.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the eleven or more spring/riparian areas in the East Big Springs Allotment and an undetermined number of springs in the West Big Springs Allotment would not be protected by construction of exclosures. Livestock use of the riparian areas would continue. However, due to the implementation of the grazing system, two riparian pastures would be created. The pastures with the springs would be grazed early every other year and rested during alternate years, which should result in improvement of the riparian areas.

Non-implementation of the vegetation treatments (seedings) would reduce the potential for removing some pressure from the riparian areas during the hot season. Therefore, improvement in the riparian areas would only be to the extent possible through the changes in the grazing system.

Under this alternative, the riparian areas would continue to be a potential site for non-native invasive species establishment until improved conditions are achieved.

3.3.2.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, only two spring exclosures would be constructed in the East Big Springs Allotment and an undetermined number of exclosures would be constructed in the West Big Springs Allotment. The proposed grazing system would provide growing season rest in Payne Basin, East Squaw Creek, and North Pequop Mountain pastures and allow for growing season rest in these pastures. The lack of hot season use in the North Pequop Mountain Pasture, where most of the riparian areas are located, would allow improvement of the riparian vegetation. Under this alternative, the riparian areas would continue over the short-term to be a potential site for non-native, invasive species establishment.

Improvement over the long-term should decrease the potential for non-native, invasive species to establish.

3.3.3 Avian Sensitive Species

3.3.3.1 Affected Environment

The regulatory framework with respect to avian sensitive species is provided in **Appendix B**.

Based on the Minute Order issued by Judge McKibben, sage grouse was the only species for which analysis was required. Sage-grouse occur within the northern and central portions of the allotment. A description of the habitat requirements and food habits of sage grouse is provided below.

Sage Grouse

Habitat descriptions for sage grouse are included in Section 3.2.3.1.

Eleven leks or lek complexes have been documented in the allotment, along with nesting, brood, summer, and winter habitat. Sage grouse have not been documented in the Independence Valley, south of Interstate 80 or in Goshute Valley south and east of the railroad track. The sagebrush plant community located on the benches east of the Pequop Mountains, between the salt desert shrub in the valleys and pinyon-juniper on the mountain slopes is the primary breeding, nesting, and wintering area south of Interstate 80. Potential summer range occurs at the high elevation mountain tops, where low sagebrush and black sagebrush cover the ridges and mountain big sagebrush occurs in the basins and draws. North of Interstate 80, winter, breeding, and nesting habitat occurs on benches and foothills at the west, north, and east portions of the Pequop Mountains. The upper elevations of this portion of the mountain range have more intact sagebrush available for brood habitat and summer range. The springs, seeps, and drainages also provide important brood habitat in this area.

3.3.3.2 Environmental Consequences

3.3.3.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Direct impacts to sage grouse under this alternative, such as nest destruction, would be incidental. Indirect effects have potential to occur at nesting habitat and summer brood habitat. Direct disturbance at leks may also occur, but would also be incidental.

Under this alternative, the East Pequop Bench Pasture would continue to receive fall/winter/spring use by livestock. Three sage grouse leks and suitable winter habitat occur in this pasture. Nesting habitat is often associated with the leks. Potential nesting habitat within the vicinity of these leks would consist of the Wyoming big sagebrush habitat located on the benches between the pinyon-juniper and salt desert shrub communities. Therefore, it is likely that sage grouse spend most of the fall through spring period in this pasture, which overlaps with the livestock period of use. The fall and winter use by livestock would reduce residual cover in the nesting areas. Residual cover has been found to be related to nest site selection and nest success. Therefore, there is potential for impacts to sage grouse nesting under this alternative.

The presence of livestock during the breeding season may also contribute to disturbance of the birds on the lek. While an individual cow or two grazing in the area can be ignored, several cows moving through the lek will cause some birds to leave for the day and others to move to other portions of the lek (Back, personal observations). If the lek is located between water and forage, the disturbance may occur repeatedly during the breeding season and interrupt breeding activities.

The Holborn, Payne Basin, East Squaw Creek, and Railroad Field pastures all receive spring/summer livestock use under this alternative. Holborn, East Squaw Creek, and Railroad pastures all have active leks located in

the pastures. The spring use would have the potential to impact nesting and breeding, as described above.

North Pequop Mountain, Payne Basin, and Six Mile Canyon pastures include the brood and summer habitat within the allotment. Six Mile Canyon brood and summer habitats may be limited in extent and quality due to the amount of woodland present. The pinyon-juniper and upper elevation conifer woodlands separate the lower elevation breeding/nesting habitat from the upper elevation sagebrush habitats, and the woodlands have encroached into the sagebrush habitats over time. Summer livestock use in these three pastures, especially use in the riparian areas, would continue to impact sage grouse brood and summer habitat through the impacts to riparian areas and springs. Conversion of the riparian vegetation to blue mustard, hoary cress, and perennial pepperweed eliminates the native forbs used by sage grouse during this period.

Under this alternative, the water developments at the springs would continue to direct all of the spring flow away from the spring riparian area to troughs. This reduces the area of riparian habitat associated with the spring, effectively reducing the quantity of sage grouse summer brood habitat.

3.3.3.2.2 Alternative 2 – Implement the Multiple Use Decision

West Big Springs Allotment

Under this alternative, North Pequop and Holborn pastures would receive livestock use during mid-May to August, or through September, respectively with deferment until August or July in alternating years (**Table 2-22**). Direct impacts to sage grouse under this alternative, such as nest destruction or fence mortalities, would be incidental. Indirect effects have potential to occur at summer brood habitat, winter habitat, nesting habitat. However, the overall effect of the alternative would be improvement of habitat quality.

The spring use would begin near the end of nesting season and is not anticipated to remove sufficient vegetative cover to substantially impact nest success. Utilization patterns under the existing grazing system indicate large acreages in each pasture receive slight to light utilization from livestock. These levels of utilization would be expected to occur under this alternative as well. Therefore, opportunity exists for sage grouse to select nest sites with residual cover.

The annual use of these pastures, or portions thereof, during the summer months has potential to impact summer brood habitat. Spring exclosures may be proposed at a future date, pending monitoring of riparian areas.

The two seedings proposed for this allotment in the Holborn and Independence Valley pastures would replace poor quality sagebrush with an undetermined plant community. As described above in Section 3.3.1.2.2, the potential exists for the sagebrush to be replaced with non-native grasses, native grasses, native shrubs, a non-native semi-shrub, and non-native forbs. Such a mix would generally convert the combined acreage of 5,000 acres of winter or potential nesting habitat to non-habitat for sage grouse.

The proposed fences have potential to cause sage grouse mortalities resulting from collisions with the newly constructed fences. The East and West Big Springs Boundary Fence in the North Pequop Pasture would occur in sage grouse summer habitat; therefore potential exists for collisions.

The predicted improvement in the range condition and riparian improvement as a result of implementation of this alternative is anticipated to improve the overall quality of sage grouse nesting and summer habitat in this allotment.

East Big Springs Allotment

Under this alternative, East Pequop Bench, Payne Basin, Six Mile Canyon, East Squaw Creek, and North Pequop Mountain pastures would all be on a deferred rotation between spring and summer/fall use or spring and fall/winter use. Direct impacts to sage grouse under this alternative, such as nest destruction or fence mortalities, would be incidental. Indirect

effects have potential to occur at summer brood habitat. However, the overall effect of the alternative would be improvement in habitat quality.

All of these pastures include potential nesting habitat; therefore, grazing would occur during the spring (early or late, depending on the pasture and year) nesting period. Utilization patterns under the existing grazing system indicate large acreages in each pasture receive slight to light utilization from livestock. These levels of utilization would be expected to occur under this alternative as well. Therefore, opportunity exists for sage grouse to select nest sites with residual cover, and the spring grazing is not likely to impact nesting success.

The annual use of these pastures, or portions thereof, during the summer months has potential to impact summer brood habitat. The spring exclosures proposed for these pastures would improve the riparian habitat conditions, which would benefit sage grouse. The fences associated with the spring exclosures may have an impact due to collisions, but sage grouse generally approach spring areas on the ground using the sagebrush cover to conceal their approach. Therefore, the fences are not anticipated to be a major mortality factor.

The drift and pasture fences proposed for Six Mile Canyon, North Pequop Mountain, and Squaw Creek pastures have potential to cause sage grouse mortality through collisions with the new fences.

Two seedings in the East Pequop Bench Pasture would replace annual vegetation with a mixture of non-native and native species on approximately 3,000 acres that burned in the Oasis Fire, and approximately 4,000 acres of salt desert shrub and some sagebrush, with an undetermined plant community. The seeding at the Oasis Fire site would improve conditions for sage grouse, depending on the seed mix. Replacement of the mostly annual cheatgrass with perennial vegetation would be a start in restoring sage grouse winter, spring, and fall habitat values. As for the second seeding, much of the area is not considered sage grouse habitat.

Approximately 1,200 acres in the East Squaw Creek Pasture would also be seeded and replace degraded sagebrush range. The impact of this seeding would depend on the species included in the seed mix. The current proposal includes desirable grasses and forage kochia. Any seeding of this type would be a net loss of habitat for a majority of wildlife species, including sage grouse where the seeding is associated with sage grouse habitat.

The eleven spring exclosures included in this alternative have potential to improve the riparian habitats, which would improve the quality of sage grouse summer brood habitat.

3.3.3.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

West Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction or fence collisions, would be incidental. Indirect effects have potential to occur at summer brood habitat. Direct disturbance at leks may also occur, but would also be incidental.

Under this alternative, the West Squaw Creek Pasture would receive spring/summer use every other year complete rest in alternate years, and the Holborn Pasture would receive spring/summer use every other year and late use for fifteen days every year. These two pastures have potential nesting habitat and the spring use would be initiated near the end of nesting season. Therefore, impacts to sage grouse nesting success would be negligible.

The riparian pasture, West Squaw Creek Riparian Pasture, would be grazed in a manner to improve riparian vegetation. This would improve sage grouse summer brood habitat.

The two seedings proposed under Alternative 2 for Holborn and Independence Valley pastures

would not be implemented under this alternative. The sagebrush in these areas would continue to provide some winter habitat value, but the depleted understory would preclude these areas from providing nesting or brood cover. Therefore, these two areas would remain as sagebrush vegetation, but have very limited value to sage grouse.

Under this alternative there would be a reduced potential for sage grouse mortality related to fence construction associated with the range improvements identified in Alternative 2 and Alternative 4.

East Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction or fence mortalities, would be incidental. Indirect effects have potential to occur at summer brood habitat, nesting habitat, and winter habitat.

Under this alternative, livestock use in the East Pequop Bench Pasture would occur during the nesting season and potential exists for reduction of nesting cover. The late spring use, followed by a year of complete rest, in the Payne Basin and East Squaw Creek Riparian pastures would have negligible impact on nesting cover in the year of use and allow both residual cover and new growth at nesting sites in the year of rest.

The North Pequop Mountain Pasture would receive late summer use annually, which would reduce residual cover for nesting habitat the following spring. The creation of the East Squaw Creek Riparian Pasture would improve sage grouse brood habitat quality.

The impacts from the other range improvements would be as discussed under Alternative 2.

3.3.3.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

West Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction or fence mortalities, would be incidental. Indirect effects have potential to occur at nesting habitat, summer habitat, and winter habitat.

Under this alternative, spring livestock use of the Holborn and North Pequop Mountain pastures would be eliminated, which would provide for sage grouse nesting in the absence of livestock and result in the availability of all the current year's herbaceous growth to provide nesting and brood rearing cover. The summer and late fall use in the Holborn Pasture and late summer/early fall use in the North Pequop Pasture would reduce the residual cover in these nesting habitats and monitoring would be necessary to determine if sufficient residual cover would be available in these nesting habitats.

East Big Springs Allotment

Direct impacts to sage grouse under this alternative, such as nest destruction or fence mortalities, would be incidental. Indirect effects have potential to occur at summer habitat, winter habitat, and nesting habitat.

Under this alternative, grazing in two pastures with nesting habitat would be deferred until summer (North Pequop Mountain and East Squaw Creek pastures) and use in two other pastures with nesting habitat (East Pequop Bench and Payne Basin pastures) would be either of short duration or late spring use rotated with complete rest. This would allow nesting in two of the pastures to occur in the absence of livestock and result in the availability of all the current year's herbaceous growth to provide nesting and brood rearing cover. As discussed above for the West Big Springs Allotment, there is some potential for the summer use in these pastures to remove residual cover for the following nesting season.

Impacts from the seedings and other range improvements would be as discussed under Alternative 2 above, except the 1,200-acre East Squaw Creek Seeding would not be included in this alternative.

3.3.4 Conservation/Mitigation Recommendations and Residual Impacts

3.3.4.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

No conservation or mitigation recommendations for vegetation have been made for Alternative 1. This alternative represents the system which was evaluated in the allotment evaluation process and Alternative 2 was developed to make the necessary changes required to meet rangeland health standards and allotment objectives.

Mitigation would include annual inspection of the spring areas and treatment, as necessary, of non-native, invasive species.

Residual impacts under this alternative include non-achievement of rangeland health standards for the upland sites and riparian sites. Shrubs and grasses would continue to suffer the effects of early spring defoliation, heavy utilization near water sources, and repeated hot season use. Non-native, invasive species would continue to spread throughout the allotments where livestock concentrate and where wild horse impacts occur.

Residual impacts would include heavy to severe use of the spring areas and potential for non-native, invasive species to establish at the spring sites and displace the riparian vegetation.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact to sage grouse.

3.3.4.2 Alternative 2 – Implement the Multiple Use Decision

Under this alternative, the potential exists for not meeting rangeland health standards in the Independence Valley Pasture. Mitigation would include revising the pasture use to allow for rest between grazing use periods. Potential exists for impacts to shrub productivity in the Holborn Pasture. Mitigation would include annual monitoring of shrub utilization to ensure that objectives are being met.

The impacts to native vegetation from the proposed seedings would be mitigated by using a native seed mix suitable to the range sites.

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas and the perimeter of the exclosures to detect and subsequently treat noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the water troughs. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Mitigation under this alternative would include annual evaluation of the non-enclosed springs to determine if rangeland health standards for riparian areas are being met and treatment, as

necessary, of non-native, invasive species. Inspection of the areas near the troughs would also be necessary to ensure non-native, invasive species do not establish at these sites and then spread to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Mitigation for impacts of the seedings to sage grouse would be to modify the seed mix to a native species mix or inclusion of some desirable non-native species to control cheatgrass.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

Residual impacts to riparian vegetation under this alternative would be to the non-enclosed spring areas. Potential for non-native, invasive species to establish on these areas would continue.

Residual impacts would occur at the spring exclosure for sage grouse if the exclosure vegetation becomes shrub or tree dominated. The value of this area would decline for sage grouse. Mitigation would include occasional, short-term grazing or other shrub treatment to keep the riparian area at least partially as a meadow complex for sage grouse broods.

3.3.4.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

A residual impact under this alternative would include extensive non-native, invasive species expansion within upland areas.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact to sage grouse.

3.3.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Mitigation under this alternative would include re-assessment of existing water developments to allow some spring flow to maintain the spring brook and associated riparian vegetation.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

A residual impact under this alternative would be the potential long-term change in species composition due to the repeated use of some pastures at the same time each year.

Under this alternative, impacts to the riparian areas at springs would continue as an ongoing and residual impact to sage grouse.

3.3.5 Cumulative Effects

3.3.5.1 Past Actions

Historic grazing in northern Nevada is described in Section 3.2.5.1.

As indicated in the Allotment Evaluation (BLM 2000b) there have been at least 113 wildland fires documented on the Big Springs Allotment. Most of these fires occurred in the pinyon-juniper and mixed conifer vegetation on the Pequop Mountains, Toano Range, and Wood Hills. Most of the fires were small lightning strikes associated with precipitation and burned less than one-half acre. However, several fires in the 100- to 300-acre size and from 1,000- to 3,500-acre size have occurred. Since 1991 three fires have burned a total of 8,050 acres in this allotment. Fire rehabilitation projects included seeding with a variety of seed mixes or direct planting of shrub seedlings. Cheatgrass is common within these burned areas and the potential for more frequent ignitions in these same areas now exists.

The lack of fire during the mid-1900s up until the more recent increase in fires, allowed pinyon-juniper woodlands to expand into the sagebrush communities, especially the black sagebrush community. This expansion reduced the amount of sage grouse habitat, primarily along the foothills and benches. The expansion of the woodland community in canyons and along drainages also created unsuitable conditions for sage grouse to use these areas as summer brood habitat. The woodland is raptor habitat and sage grouse generally avoid wooded areas. The loss of sagebrush-bunchgrass communities also had potential to reduce cottontail and jackrabbit populations, two primary prey species for the larger raptors. Consequently, there was an increase in nesting habitat for some species of raptors, but a decline in foraging habitat for other raptor species.

Where sagebrush was not being replaced by pinyon-juniper, the competition between shrubs and grasses, as the shrubs increased in density and stature, created additional stress on the grasses. The ability of shrubs to acquire soil moisture and nutrients is greater than the ability of grasses. Where grazing adds to the stress on grasses by depleting root reserves, the decline in grass abundance is accelerated. Periodic treatment of the vegetation, combined with seeding native perennial grasses when necessary, would offset the change in fire ecology that has eliminated the low to moderate intensity fires that kept the sagebrush community productive. This has had an overall impact on the productivity of many range sites, which has likely resulted in less prey species through loss of herbaceous forage and seed abundance. Similarly, this loss of various age classes and structure of the sagebrush community has resulted in less pre-laying, nesting, and early brood habitat for sage grouse.

Although the construction of the railroad occurred before many of the non-native, invasive species were introduced to the Great Basin, the construction did create disturbance that allowed native weedy species to establish and dominate the railroad right-of-way, borrow pits, gravel pits, and the railroad stations, like Shafter (water supply stops for the old steam engines). The trains, especially the old steam engines, but even the modern day trains, cause wildland fire ignitions. These fires facilitate the establishment of cheatgrass in the salt desert shrub and sagebrush communities. The railway has also

been a travel way for non-native, invasive species to move across the landscape.

Similarly, Interstate 80 is a travel way for non-native, invasive species and increases the potential for man-caused fire ignitions. Interstate 80 extends through the allotment from the east side to the northwest side.

Within the last decade, mineral exploration has occurred within the Pequop Range which resulted in exploration road and drill pad disturbance. Reclamation was completed on this disturbance, and some of the previous land use values have been restored.

The build-up of wild horse population within the HMA has also contributed to the current condition of the springs and upland vegetation.

3.3.5.2 Present Actions

Impacts of the pre-MUD grazing were detailed in the BLM Allotment Evaluation (BLM 2000b) and summarized in the analysis in Section 3.2.2.1.3.2 above. Dispersed recreation, including hunting, OHV (Off Highway Vehicle) use, and BLM-authorized OHV organized events are responsible for the creation of new trails, which become pathways for non-native, invasive species. Creation of the trails impacts the established flora by physically damaging the plants, creating soil erosion, and creating competition between the native plants and the non-native, invasive species.

Recent drought has also affected the productivity of the plants. Minimal leader growth on the shrubs was observed in recent years, resulting in voluntary non-use of the allotments.

Wildlife habitat and the use of the habitat by wildlife were not identified in the allotment evaluation as contributing to the non-achievement of allotment objectives or rangeland health standards. In contrast, the use of certain habitats by wild horses did contribute to the non-achievement of objectives and standards.

The use of the Goshute Mountain monitoring site by Hawkwatch International has been subject to the conditions required for WSAs and has had minimal impact on the vegetation or sage grouse.

3.3.5.3 Reasonably Foreseeable Future Actions

The continuation of grazing under Alternatives 2, 3, or 4 would be anticipated to improve the general condition of the range. Alternative 3 would not provide for improvement of the springs and riparian vegetation. Non-native, invasive species would be anticipated to continue to be present in the allotments, but the rate of increase is likely to be less under Alternatives 2 and 4.

Overall improvement of the habitat for sage grouse and raptor prey species is anticipated under Alternatives 2 and 4, and improvement of only the uplands is anticipated under Alternative 3.

Fire suppression and burned area emergency rehabilitation are likely to continue. This is likely to reduce the changes in the plant community due to large fires (i.e., fire suppression should limit the size of the fires), but also result in somewhat less diverse communities in the short-term (i.e., the fire rehabilitation seed mixes generally only include a few species).

The acreage of habitat for prey species and raptor foraging is likely to be reduced by expansion of human occupation of private lands within the allotments near Wells, Nevada. These allotments are likely to receive increased recreational use, which has potential to increase the abundance of non-native, invasive species.

3.4 Owyhee Allotment

3.4.1 Vegetation Resources (Including Non-native, Invasive Species)

3.4.1.1 Affected Environment

The regulatory framework with respect to vegetation and non-native, invasive species is provided in **Appendix B**.

The allotment is characterized by a high rolling plateau underlain by basalt flows which are

occasionally cut by deep, vertically walled canyons. Elevations range from approximately 5,100 feet to 5,600 feet. In general, the vegetation consists of basin big sagebrush, Wyoming big sagebrush, Sandberg bluegrass, bottlebrush squirreltail, and lesser amounts of bluebunch wheatgrass, Indian ricegrass, and needlegrass. Mat muhly is a grass species associated with the Wet Clay Basin Ecological Site on vegetated playas.

Three noxious weeds have been identified at 59 sites within the Owyhee Allotment. The majority of these infestations have been found along roadsides and a few were found along stream channels. Hoary cress was found at 28 different sites and covered approximately 850 acres. Canada thistle was identified at nine sites with a total distribution of 220 acres. Six sites totaling approximately 175 acres were infested by Scotch thistle. Several infestations overlapped, with one or more species occurring on the same site. Therefore the total acreage of noxious weed infestation is less than the total of the individual species' infestations.

Other non-native, invasive species found within the allotment include halogeton, cheatgrass, and tumble mustard. Most occur in disturbed sites, roadsides, and burned areas. Cheatgrass is common in the understory of some native ranges.

3.4.1.2 Environmental Consequences

The Owyhee Allotment is used by cow/calf pairs, domestic horses, wild horses, and wildlife. Grazing by domestic livestock has been from March 1to January 31. The wild horses and wildlife are present throughout the entire year. Cows are primarily grazers, feeding on the herbaceous forage during the growing season and dry grasses in the fall/winter. However, cows use browse (woody vegetation) during the summer, fall, and winter, transitioning to a mostly herbaceous diet in spring and early summer. Sagebrush is the major shrub species in the allotment and cows do not generally use much sagebrush. Willows and other riparian shrubs do receive use by cows during the hot season.

Although the term "range improvements" encompasses many types of actions, the range improvements proposed for the Owyhee Allotment include: wells, pipelines, spring/riparian exclosures, and spring developments.

3.4.1.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

The previous grazing permits for the Owyhee Allotment provided for a total of 30,155 AUMs. The 1987 AMP implemented a combination of rest-rotation and deferred-rotation systems to provide growing season rest in each of the native pastures one year out of two.

Actual use during the period 1981 to 1999 for Owyhee Allotment averaged 18,862 AUMs, with a low of 10,247 AUMs and a high of 29,379 AUMs.

Under this alternative, the grazing use would continue to follow the 1987 AMP. This grazing system was fully implemented in 1990 following the completion of pasture fences and seeding. The evaluation of this system (BLM 2000c, Owyhee Allotment Evaluation) concluded that while some of the rangeland health standards, allotment objectives, and key area objectives were met, others were not being met or only partially met.

Plant Productivity

The rest-rotation and deferment implemented under this system has resulted in improvement of the uplands, but riparian issues still remain. The hot season use in the Star Ridge Pasture has been voluntarily removed by the permittee since 1995. The rest given to Star Ridge and Dry Creek pastures provided grasses and shrubs the ability to grow in the absence of livestock grazing every other year. However, the use on the riparian areas resulted in utilization levels that did not allow the grasses and shrubs to adequately recover (a situation exacerbated by livestock from the adjacent allotment using the riparian areas).

The deferred use in the Lower and Upper Fourmile and Chimney Creek pastures provided growing season rest every other year and late spring rest each year. This amount of growing season rest/deferment would allow the grasses to maintain vigor.

Non-Native, Invasive Species

The grazing system under this alternative would reduce the spread of non-native, invasive species as a result of the increased vigor of the native grasses. Occupation of the riparian areas by non-native, invasive species would continue under this system, as the native riparian vegetation has not recovered sufficiently to reduce the opportunity for non-native, invasive species to establish.

3.4.1.2.2 Alternative 2 – Implement the Multiple Use Decision

The grazing system proposed in the MUD is described in Section 2.5.2. The permitted livestock use of 29,903 AUMs under this alternative represents a reduction of 252 AUMs from Alternative 1. However, the 29,903 permitted under this alternative would be 11,041 AUMs greater than the average use recorded between 1981 and 1999. Period of use for the allotment would be mid-February to mid-December with use spread out by pastures and seasons over the year (Table 2-34 and Table 2-35). Wild horse AUMs would be 2,369 AUMs or an increase of 425 AUMs over the actual use during the period 1982 to 1999.

Plant Productivity

The Star Ridge Pasture would receive late winter use and early spring/summer use every other year and complete rest in the alternate years under this alternative. The early spring/summer use each year has the potential to remove early growing points as the grasses grow. This is anticipated to impact grass vigor and productivity near water sources or other areas of heavy use. Impacts to grasses are not anticipated for areas of slight or light use, as sufficient leaf growth would occur to allow carbohydrate production and complete the growth cycle. Fall regrowth would occur in this pasture, completing the root growth and replacement, and the complete rest for one year after each year of use would facilitate grass vigor. Shrub use is anticipated to be minimal during this season of use.

Chimney Creek Pasture would receive early spring and fall/early winter use alternating with summer use under this alternative. Impacts to grass plants are likely to occur in areas of heavy use, but not in areas of slight to light use during years when spring and fall/early grazing occurs. The split season would result in herbivory during both the spring growing season and the fall regrowth period. Potential is high for impacts to grasses in this pasture under this system if utilization standards are not met. Because this split season use is followed by growing season and fall regrowth period rest the following year, grass vigor should be maintained. Shrub use is anticipated to be slight during the split season use, but increased use of shrubs is anticipated during the years of hot season use. However, cows do not normally make much use of sagebrush.

Use in Lower Fourmile Pasture rotates between summer/fall use one year and early spring and fall use (split season) in alternate years. The summer/fall use occurs during the dormant season for cool season grasses and the beginning of the fall regrowth period. Plants would be able to complete their growing cycle under this season of use and have some late fall regrowth. During the split season use, the impact to grasses and shrubs would be as described above for the split season for Chimney Creek Pasture.

Use in Upper Fourmile Pasture rotates between summer/fall use in one year and early spring use in alternate years, and horse use each year in early spring through mid-December. The complete growing season rest in the summer/fall use years followed by fall regrowth before the spring use years would allow the plants sufficient period to complete root growth and replacement. Utilization of shrubs is anticipated to occur in the years of summer/fall use. Horse use throughout

the spring, summer, and all fall would have potential to impact vegetation in the vicinity of water sources through use during the growing season and fall regrowth period.

Winters Creek Seeding (crested wheatgass seeding) would receive split season use each year during the spring and fall. The potential exists for reduction in plant vigor if utilization levels are exceeded as grazing would occur during both periods of carbohydrate production, plant growth, and root growth/replacement. Maintenance of sufficient leaf area during the growing season and fall regrowth periods would be critical under this split season use.

Dry Creek Pasture would be rested in the years that Star Ridge Pasture is used. When Star Ridge Pasture is rested, Dry Creek Pasture would receive late winter use followed by early spring into summer use. The late winter and early spring use would occur in different areas within the pasture. The early spring/summer use each year has the potential to remove early growing points and growing points as the grasses grow. This is anticipated to impact grass vigor and productivity near water sources or other areas of heavy use. Impacts to grasses are not anticipated for areas of slight or light use, as sufficient leaf growth would occur to allow carbohydrate production and complete the growth cycle. Fall regrowth would occur in this pasture, allowing new buds to form and root growth to be completed, and the complete rest for one year after each year of use would facilitate grass vigor. Shrub use is anticipated to be minimal during this season of use.

Range Improvements

Under this alternative, one well, 17 miles of pipeline, two miles or more of gap fence, and one spring exclosure/development would be constructed. The surface disturbance associated with these range improvements would result in a short-term direct effect to vegetation through the removal of the vegetation. The duration of this effect would be determined by the time required for reseeding to establish, which could be three or more years for the herbaceous plants and ten or more years for shrubs.

The improved distribution of grazing is anticipated to improve grass and shrub vigor near the existing water sources by shortening the duration and intensity of grazing in these areas.

Non-Native, Invasive Species

The surface disturbance associated with the proposed range improvements would have potential for establishment by non-native, invasive species. The improved distribution of grazing would reduce potential for non-native, invasive species to establish in the areas that are currently receiving heavy use from livestock and wild horses. The proposed riparian exclosure would also be expected to reduce potential for non-native, invasive species establishment through recovery of the riparian vegetation.

3.4.1.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the permitted livestock use of 27,837 AUMs represents a reduction of 2,318 AUMs from Alternative 1. However, the 27,837 AUMs permitted under this alternative would be 8,975 AUMs greater than the average use recorded between 1981 and 1999. The proposed grazing system under this alternative is described in detail in Section 2.5.3.

Under this alternative, the riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge pastures would be obtained without constructing the proposed riparian fence and exclosure in the Lower Fourmile Pasture and through changes in the proposed grazing system.

Plant Productivity

The Star Ridge Pasture would receive early spring/summer use followed by a complete year of rest. The use during the majority of the growing season would have potential to impact grass growth and carbohydrate production due to the

early spring grazing and continuous growing season grazing, if utilization standards are exceeded. Impacts near water sources are anticipated under this alternative.

Chimney Creek Pasture would receive grazing use in late spring into summer in one year followed by fall use the next year. During the late spring into summer use year, the grasses would have carbohydrate production reduced, but would have the fall regrowth period and the following growing season to recover. During the fall use year, fall replenishment of the carbohydrates would be reduced, but the plants would have the following early spring to initiate growth without grazing. Therefore, impacts to grasses would be minimal under this alternative.

Use in Lower Fourmile and Upper Fourmile pastures would alternate among years from spring use in one year and complete rest the following year. Grazing during most of the growing season would have potential for early defoliation and some reduction in carbohydrate production. However, the grasses would have the fall regrowth and complete growing season/fall regrowth period the following year to recover. No impact to plant vigor is anticipated under this use pattern.

Winters Creek Seeding would receive late fall use in one year and fall/late fall use in alternate years. The grasses would have the entire growing season each year, and the fall regrowth period every other year to recover. Impacts to grasses are not anticipated under this pasture.

Dry Creek Pasture would receive summer/fall use in one year and summer use in alternate years. The grasses would have the full growing season every year and the fall regrowth period every other year to replenish the carbohydrate reserves and complete the growth cycle. Use on shrubs during the hot season would occur in this pasture. Impacts to shrubs would be anticipated to occur if utilization standards are exceeded.

Range Improvements

The impacts to vegetation from the construction of the range improvements would be the similar as for Alternative 2 except that the riparian exclosure would not be constructed and less surface disturbance would occur under this alternative. In addition two new wells and 17.5 miles of additional pipeline would be constructed to facilitate the grazing system. The impacts to vegetation would be the same as described for Alternative 2, except the amount of surface disturbance would be greater, and therefore, the direct impacts to vegetation would be greater under this alternative. The indirect impacts would be similar to those described for Alternative 2.

Non-Native, Invasive Species

The potential for establishment and spread of non-native, invasive species would be greater under this alternative than for Alternative 2 because protection of the spring source would not be provided and these areas are susceptible to establishment by non-native, invasive species.

3.4.1.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, the permitted livestock use of 20,706 AUMs represents a reduction of 9,449 AUMs from Alternative 1. However, the 20,706 AUMs permitted under this alternative would be 1,844 AUMs greater than the average use recorded between 1981 and 1999. The proposed grazing system under this alternative is described in detail in Section 2.5.4.

Under this alternative, the riparian objectives on the South Fork Owyhee River within the Lower Fourmile and Star Ridge pastures would be obtained without constructing the proposed fence in the Lower Fourmile Pasture and through changes in the proposed grazing system.

Plant Productivity

Star Ridge Pasture would receive complete rest in one year and spring/early summer use in the alternate years. The continuous growing season use effect would be offset by the fall regrowth period and complete rest the following year.

Chimney Creek Pasture would receive summer and fall use each year, with the duration of use shorter in alternate years. The complete growing season rest each year and partial fall regrowth period in alternate years would limit impacts to the grass species. However, the hot season use each year has potential to impact shrub species. Sagebrush is the primary species in the pasture and use of sagebrush is limited at this time of the year.

Lower Fourmile Pasture would alternate between spring use and complete rest. The fall regrowth and year of complete rest would eliminate impacts to grass vigor under this alternative.

Upper Fourmile Pasture would alternate between a year of complete rest followed by late fall use. Grasses would have complete rest each year during the growing season and limited use one out of every two years during the fall regrowth period. Impacts to grasses and shrubs are not anticipated under this alternative.

The use in Winters Creek Seeding would be fall use each year, with the duration and time of the use varying between years. The crested wheatgrass would have complete growing season rest each year and some deferment of the fall regrowth period in alternate years. No impacts to the crested wheatgrass are anticipated under this system.

Dry Creek would receive use in early summer alternated with complete rest the following year. Impacts to grasses are not anticipated under this system.

Range Improvements

Under this alternative, none of the range improvements proposed under Alternative 2 or 3 would be constructed; however the wildlife projects may implemented. The vegetation treatments for wildlife habitat improvement would create a short-term direct impact to the existing vegetation; however, the long-term effect would be an improvement in the overall stand structure and diversity. Installation of guzzlers would have minimal impact due to the limited area of disturbance.

Non-Native, Invasive Species

The surface disturbance associated with the proposed range improvements would have potential for establishment by non-native, invasive species. The improved distribution of grazing would reduce potential for non-native, invasive species to establish in the areas that are currently receiving heavy use from livestock and wild horses.

3.4.2 Wetland/Riparian Zones

3.4.2.1 Affected Environment – Owyhee Allotment

The regulatory framework with respect to wetland/riparian zones is provided in **Appendix B**.

Perennial stream flow is limited to the South Fork Owyhee River. The reaches of Fourmile and Winters creeks within the allotment are intermittent. Riparian vegetation is limited to a narrow corridor within the canyons and consists primarily of grasses, sedges, and rushes. Willows are located in portions of the South Fork Owyhee River canyon.

Two springs occur within the allotment. Devils Corral Spring in Star Ridge Pasture is a sedge-dominated site that is in excellent condition. Bookkeeper Spring is located in Dry Creek Pasture and receives heavy use by wild horses.

3.4.2.2 Environmental Consequences

The Owhyee is used by cow/calf pairs, wild horses, and wildlife. The wild horses, and wildlife are present throughout the entire year. Livestock are on the allotment in various pastures for ten months each year (February through December). The limited distribution of water within the vast area of the allotment results in concentrations of wild horses, wildlife, and livestock at the water sources.

3.4.2.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Under this alternative, the rangeland health standards for riparian areas of the South Fork Owyhee River within the Fourmile Pasture and within the Star Ridge Pasture would not be achieved. Heavy livestock use has been attributed as the cause for not meeting the objectives at these sites. Similarly, the rangeland health standards for riparian areas would not be met at Bookkeeper Spring, but the cause has been attributed to wild horses.

3.4.2.2.2 Alternative 2 – Implement the Multiple Use Decision

Under this alternative, the changes in grazing and the proposed range improvements for the Fourmile and Star Ridge pastures were developed to improve the riparian habitat conditions. The winter/spring use followed by complete rest in the Star Ridge Pasture would eliminate the hot season use that is generally the cause of riparian degradation. In the Lower Fourmile and Upper Fourmile pastures, hot season use would be alternated with spring and fall grazing in Lower Fourmile Pasture, and with spring use in Upper Fourmile Pasture. Due to alternate year hot season use, the recovery of the riparian vegetation would occur at a slower rate than is anticipated for the Star Ridge Pasture, but recovery is anticipated.

The installation of one new well and six miles of pipleline within the Star Ridge Pasture would provide water sources to reduce grazing pressure on the South Fork Owyhee River. Similarly, the gap fencing proposed for the Lower Fourmile and Chimney Creek pastures would reduce grazing pressure on the upper portions of Fourmile Creek.

3.4.2.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Under this alternative, the grazing system would be the primary means of reducing grazing on the South Fork Owyhee River. The alternating growing season rest and growing season use would eliminate hot season use of the riparian vegetation in the Star Ridge Pasture. A similar alternating of spring use with rest the following year in the Lower Fourmile and Upper Fourmile pastures would also eliminate hot season use of the riparian vegetation.

However, the elimination of the riparian exclosure for Bookkeeper Spring would allow continued use of the spring and riparian area by wild horses throughout the hot season, and impacts to this spring area are anticipated to continue.

3.4.2.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Under this alternative, the riparian objectives for the South Fork Owyhee River within the Lower Fourmile and Star Ridge pastures would be obtained without constructing the proposed fence in the Lower Fourmile Pasture.

Grazing in the Lower Fourmile and Star Ridge pastures would alternate between complete rest and spring or spring/early summer grazing to eliminate hot season use in these pastures with riparian vegetation. Similarly, the hot season use in the Upper Fourmile Pasture would be eliminated by alternating use between complete rest and late fall grazing. The result would be recovery of the riparian vegetation, albeit at a slower rate than if the riparian fences were installed.

3.4.3 Avian Sensitive Species

3.4.3.1 Affected Environment

The regulatory framework with respect to avian sensitive species is provided in **Appendix B**.

Based on the Minute Order issued by Judge McKibben, the species for which analyses were required included northern goshawk, golden eagle, short-eared owl, long-eared owl, burrowing owl, ferruginous hawk, Swainson's hawk, prairie falcon, and peregrine falcon. Sage grouse also occur within the allotment.

Northern goshawk is only an occasional winter visitor to the allotment and ferruginous hawk is also an occasional visitor. No suitable nesting habitat for goshawk occurs within the allotment. Due to its occasional winter visitor status, impacts to this species from the various alternatives would be minor, and this species is not considered further in the analysis. Similarly, ferruginous hawk nesting habitat is limited in the allotment to rock pillars. The major limiting factor for this species on the allotment is availability of suitable nesting sites, not prey abundance. Therefore, ferruginous hawk is not considered further in the analysis.

Habitat descriptions for the raptors and sage grouse are included in Section 3.2.3.1.

Swainson's hawks likely nest in the mature willows or rock ledges within the allotment and on private lands adjoining the allotment. They forage at hayfields and over the sagebrush within the native pastures.

Prairie falcons are known to nest in high densities in the Star Ridge and Fourmile pastures in the cliffs overlooking the South Fork Owyhee River. The expanse of sagebrush surrounding the canyon provides the foraging habitat for this species.

Long-eared owls use the older age class willow on South Fork Owyhee River and Fourmile Creek. Foraging habitat would be limited primarily to the Star Ridge and Fourmile pastures.

Burrowing owls could potentially occur throughout the allotment where sagebrush occurs and in areas where sagebrush borders grasses or upland meadows.

Twelve sage grouse leks have been identified within the allotment as of 2005. Four occur in the Star Ridge Pasture, seven in the Dry Creek Pasture, and one occurs in the Winters Creek Seeding Pasture. Nesting, early (upland) brood-rearing, and fall/winter habitat occurs throughout the allotment. Late (riparian/meadow) brood-rearing habitat is primarily limited to the South Fork Owyhee River, the Fourmile Creek drainage (mainly private lands), and two spring areas on public lands. It is highly likely that brood movements occur off the allotment to riparian and meadow areas on public and private lands, as succulent vegetation desiccates on upland areas.

3.4.3.2 Environmental Consequences

3.4.3.2.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

Raptors

No direct impacts to the raptor species were identified. Most of the nesting takes place on cliffs and rock outcrops in the South Fork Owyhee River Canyon, areas not used by livestock. Burrowing owls nest in burrows and may have some vulnerability to trampling by livestock that would cause collapse of the burrow. This would be a rare event. The other raptors nest on ledges and other locations not likely to be impacted directly by livestock grazing.

The use of the rangeland habitats within the allotments by Swainson's hawks and prairie falcons is primarily for foraging – hunting for prey. The sagebrush vegetation supports jackrabbit populations, and ground squirrel populations are common in the sagebrush openings where fires or vegetation treatments have occurred. Other prey, such as birds, snakes, and small rodents, are common within the allotment. Under this alternative, some reduction in the quality of

habitat for prey species has occurred, especially in the sagebrush plant community where shrub density has been a cause of herbaceous plant decline due to competition. The increase in shrub density and stature also makes it more difficult for raptors to capture prey. However, there is no evidence that the prey base is limiting the populations of these raptors.

The impacts to riparian vegetation have resulted in degradation of habitat for the long-eared owl, short-eared owl, and sage grouse, as well as habitat of prey species for the other raptors.

Sage Grouse

Of the twelve sage grouse leks known to occur within the allotment, four occur in the Star Ridge Pasture, and seven are in the Dry Creek Pasture. Grazing occurs in these pastures alternates between rest and early spring/summer grazing beginning on March 1 and continuing through June 30 (permitted until August 15, voluntary end of grazing by June 30). This coincides with the breeding season (March – May); therefore, there is opportunity for disruption of the lek activity by livestock in alternate years. Nesting habitat also occurs in these pastures and the spring grazing may remove nesting cover. However, residual cover from the cessation of grazing by June 30 and the alternate year complete rest is available under this system. Direct impacts to sage grouse are not anticipated under this alternative. Because the grazing overlaps with the nesting season, potential exists for nest destruction through trampling, but this would be a rare event and considered incidental.

Summer brood habitat, consisting of riparian vegetation adjacent to sagebrush cover may be the limiting factor for this allotment. The playa areas within the allotment have been sites of brood observations in the past. Use of the steep canyon bottoms by sage grouse is not likely. However the meadow and riparian areas along portions of South Fork Owyhee River, Fourmile, Winters, and Chimney creeks, and the springs within the allotment provide some summer brood habitat. Impacts to the riparian areas from hot season use by livestock and wild horses have degraded the riparian areas and one of the spring areas. The quality and quantity of summer brood habitat would continue to be impacted under this alternative.

3.4.3.2.2 Alternative 2 – Implement the Multiple Use Decision

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation, improved livestock distribution, and protection of riparian areas. An increase in shrub and grass vigor would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors.

This alternative also includes vegetation treatments that would open up some of the large, dense stands of sagebrush. The resulting mixture of sagebrush, perennial grasses, and forbs would improve habitat for prey species in these areas, and increase the overall diversity of wildlife in the area. These areas may be used by burrowing owls and ferruginous hawks, which tend to avoid the dense sagebrush areas. Short-eared owls may also use these grass-forb dominated areas.

Sage Grouse

Under this alternative, grazing would occur in the Star Ridge and Dry Creek pastures in late winter and spring/summer, followed by a year of rest. This coincides with the breeding season (March – May); therefore, there is opportunity for disruption of the lek activity by livestock in alternate years. Nesting habitat also occurs in the pasture and the spring grazing may remove nesting cover. However, residual cover from the cessation of grazing by June 30 and the alternate year complete rest is available under this system. Direct impacts to sage grouse are not anticipated under this alternative. Because the grazing overlaps with the nesting season, potential exists for nest destruction through trampling, but this would be a rare event and considered incidental.

Similarly, grazing would occur in Dry Creek Pasture in late winter and continue through July 31, followed by complete rest the next year. The removal of nesting cover would occur, but as with Star Ridge Pasture, residual cover would be available from the rested year. Nest trampling would be considered incidental.

Hot season use in Lower and Upper Fourmile Pastures during alternate years with spring and fall grazing (in Lower Fourmile Pasture) would coincide with sage grouse use of riparian areas within these pastures one out of every two years. The range improvements proposed to protect the riparian habitat, with measures to mitigate the effects of fence construction on wildlife, including sage grouse, would be critical to eliminating potential impacts to sage grouse summer brood habitat.

This alternative also includes vegetation treatments that would open up some of the large, dense stands of sagebrush. The resulting mixture of sagebrush, perennial grasses, and forbs would improve habitat for sage grouse. Dense stands of sagebrush are not used for breeding displays (i.e., strutting) and the increase in forbs may attract hens with broods.

3.4.3.2.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation and improved livestock distribution. An increase in shrub and grass vigor resulting from the implementation of the grazing system would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors. However, the areas of dense sagebrush are not likely to see much improvement due to changes in the grazing system. The plant competition between shrubs and herbaceous species is the major factor causing lowered species composition of forbs and grasses, as well as lowered production of these herbaceous species. The continued lack of herbaceous vegetation in these sagebrush stands would limit prey populations that depend on the herbaceous cover, herbaceous forage, and/or seeds produced by the herbaceous plants.

The elimination of vegetation treatments in this alternative would not provide the increased wildlife (i.e., prey) diversity as compared to Alternative 2. Burrowing owls, ferruginous hawks, and short-eared owls are not likely to use these large expanses of dense sagebrush.

Sage Grouse

Star Ridge Pasture would receive spring use alternating with complete rest under this alternative. The spring use would coincide with sage grouse breeding activities, and impacts would be similar to those described for Alternative 2.

Dry Creek Pasture would receive summer and fall use alternating with summer use under this alternative. Potential for disruption of sage grouse breeding or nesting activities would not occur in this pasture under this system.

The Upper and Lower Fourmile pastures would receive spring use alternating with complete rest under this alternative. This would eliminate impacts to sage grouse summer brood use by avoiding hot season grazing of the riparian areas. Chimney Creek Pasture would receive summer use alternating with fall use, which would also improve summer brood habitat for sage grouse.

Bookkeeper Spring would continue to receive hot season use by wild horses and this area of summer brood use would not improve under this alternative.

As described for raptors, the lack of vegetation treatments under this alternative would maintain the sagebrush-dominated vegetation with a concomitant lack of grasses and forbs. This

would make large areas of the allotment unsuitable for sage grouse nesting and early brood habitat, where understory grasses and forbs are important habitat components, respectively.

3.4.3.2.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

Raptors

Under this alternative, no direct impacts to raptors are anticipated (see Alternative 1 above). The proposed grazing system is anticipated to improve shrub and grass productivity through the implementation of rest rotation and improved livestock distribution. An increase in shrub and grass vigor would increase habitat quality for the prey species, which would indirectly improve foraging conditions for the raptors.

Sage Grouse

Star Ridge Pasture would receive spring use alternating with complete rest under this alternative. The spring use would coincide with sage grouse breeding activities, and impacts would be similar to those described for Alternative 2.

Dry Creek Pasture would receive summer use alternating with complete rest under this alternative. Potential for disruption of sage grouse breeding or nesting activities would not occur in this pasture under this system.

The Upper Fourmile Pastures would receive fall use alternating with complete rest and Lower Fourmile Pasture would receive spring use alternating with complete rest under this alternative. This would eliminate impacts to sage grouse summer brood use by avoiding hot season grazing of the riparian areas.

Several separate groups of sage grouse have been observed roosting in areas treated for fuelbreaks on the allotment. Large expanses of dense sagebrush limit the potential for roost sites that might otherwise be used where vegetative treatments would be completed.

Chimney creek pasture would receive summer/fall use each year. However approximately ten percent of the Fourmile drainage is within this pasture with a large portion inaccessible to livestock due to rocky terrain. The remaining 90 percent of the Fourmile Creek is within the upper and lower Fourmile Pasture which would both get rest alternated with deferred use. Under this proposed two-year grazing system alternative there is the potential in Year 1 to use Winters Creek Seeding (crested wheatgrass) and Chimney Creek Pasture in June and July, and Dry Creek Pasture during the August to mid November period. Use in Chimney Creek and Winters Creek Seeding would be switched with Dry Creek (i.e., deferment of Dry Creek until after seed ripe). Factors to consider are water availability projected to allow cattle use on Dry Creek during the August 1 to November 15 period under a “wet year” scenario and any pro-rate of AUMs between the allotments to adjust to carrying capacities. This would reduce potential impacts to sage grouse during the breeding and nesting season in Dry Creek Pasture. It could also reduce livestock impacts to riparian areas on Fourmile Creek drainage.

As described for raptors, the lack of vegetation treatments under this alternative would maintain the sagebrush-dominated vegetation with a concomitant lack of grasses and forbs. This would make large areas of the allotment unsuitable for sage grouse nesting and early brood habitat, where understory grasses and forbs are important habitat components, respectively.

3.4.4 Conservation/ Mitigation Recommendations and Residual Impacts

3.4.4.1 Alternative 1 – Re-Issue Grazing Permits at Historic Levels

No conservation or mitigation recommendations for vegetation have been made for Alternative 1. This alternative represents the system which was evaluated in the allotment evaluation process and Alternative 2 was developed to make the

necessary changes required to meet rangeland health standards and allotment objectives.

Mitigation would include annual inspection of the spring areas and treatment, as necessary, of non-native, invasive species.

Residual impacts under this alternative include non-achievement of rangeland health standards for the upland sites and riparian sites. Shrubs and grasses would continue to suffer the effects of early spring defoliation, heavy utilization near water sources, and repeated hot season use. Non-native, invasive species would continue to spread throughout the allotments where livestock concentrate and where wild horse impacts occur.

Residual impacts would include heavy to severe use of the riparian areas and potential for non-native, invasive species to establish at the spring and riparian sites and displace the riparian vegetation.

Under this alternative, impacts to the riparian habitat at riparian areas would continue as an ongoing and residual impact to sage grouse.

3.4.4.2 Alternative 2 – Implement the Multiple Use Decision

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Under this alternative non-native, invasive species would continue to establish within the allotments, albeit at reduced rates than under the current management system. Mitigation for the impacts of the range improvements would include annual spring inspection of the trough areas and the perimeter of the exclosures to detect and subsequently treat noxious weeds and other non-native, invasive species. Early detection and treatment each year would prevent the undesirable species from completing their growth cycle, thus reducing the production of seeds that could be transported to other sites within or beyond the allotments.

A second mitigation measure would include seeding those areas receiving heavy use each year, as necessary, with desired perennial grass species such as Great Basin wildrye, crested wheatgrass, or other perennial grass that can better withstand the effects of concentrated livestock use at the water troughs. This would reduce the potential for non-native, invasive species to dominate the site, especially if annual treatment of noxious weeds is conducted.

Seasonal restrictions should be implemented with respect to construction of range improvements near known raptor nesting sites.

Manage suitable meadows for dense ground cover during the nesting season for short-eared owl nesting habitat and prey habitat.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

Residual impacts would occur to sage grouse at the spring exclosure if the exclosure vegetation becomes shrub dominated. The value of this area would decline for sage grouse. Mitigation would include occasional, short-term grazing or other shrub treatment to keep the riparian area at least partially as a meadow complex for sage grouse broods.

3.4.4.3 Alternative 3 – Permit Grazing Without Riparian Exclosures and Vegetation Treatments

The additional water sources proposed under this alternative have potential to create additional heavy to severe use areas in the vicinity of these new water sources. Mitigation would include

monitoring for non-native, invasive species at these sites and either treatment of infestations or seeding species suitable to the site and use levels. The other range improvements proposed also have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Seasonal restrictions should be implemented with respect to construction of range improvements near known raptor nesting sites.

Manage suitable meadows for dense ground cover during the nesting season for short-eared owl nesting habitat and prey habitat.

A residual impact would include heavy to severe use of the riparian areas and potential for non-native, invasive species to establish at riparian areas and displace the riparian vegetation.

A residual impact under this alternative would include extensive non-native, invasive species expansion within upland areas.

Under this alternative, impacts to the riparian areas would continue as an ongoing and residual impact to sage grouse.

3.4.4.4 Alternative 4 – Adjust Grazing in Key Sensitive Species Habitats

The range improvements proposed have potential to create sites for non-native, invasive species establishment. Mitigation would include annual inspection of these areas until the native vegetation is reestablished, and treatment of any non-native, invasive species, as appropriate, during the interim.

Treatment for non-native, invasive species would be mitigation for the impacts to riparian vegetation and upland sites near water sources. The continued use of these areas would exacerbate the already existing infestations of non-native, invasive species. Treatment, followed by seeding with species suited to the site would reduce the impact to the riparian areas.

Seasonal restrictions should be implemented with respect to construction of range improvements near known raptor nesting sites.

Manage suitable meadows for dense ground cover during the nesting season for short-eared owl nesting habitat and prey habitat.

Residual impacts under this alternative would include potential for non-native, invasive species to establish and spread within the allotments.

A residual impact under this alternative would be the potential long-term change in species composition due to the repeated use of Chimney Creek Pasture at the same time each year.

3.4.5 Cumulative Effects

3.4.5.1 Past Actions

The remote location of the Owyhee Allotment has limited the human activity on the allotment. Livestock grazing has been the major land use since the 1860s.

During this period from 1860 to 1940 the perennial native grasses were greatly reduced and sagebrush and other shrub species increased in dominance (Young et al. 1979). With these historic levels of livestock use, the time, duration, and intensity of grazing exceeded the ability of the plants (both grasses and some shrubs) to maintain plant vigor through the constant removal of photosynthetic tissue and growing points at all times of the year. By 1890, shrubs dominated most of the western rangelands (Young et al. 1979). By the early 1900s, the forest preserves were established, which were precursors to the national forests. As these forest preserves were established, restrictions were placed over the nomadic sheep

operations and some relief of grazing intensity began.

Most of the early range improvements implemented by the BLM were designed to increase livestock forage and stabilize soils and the actual results of these projects were mixed. Halogeton control was also an issue and crested wheatgrass, a non-native species was introduced as one means of replacing halogeton with a forage species. While there were benefits to prey species and sage grouse through the conversion from halogeton to perennial grasses, the non-native species and the monocultures that were produced had the immediate effect of creating non-habitat. As shrubs and native species established over time (30 or more years in many cases), the habitat values returned and many birds and small mammals, as well as sage grouse can be found in older seedings that have a mixture of sagebrush, native grasses and forbs, and crested wheatgrass.

In addition to the initial impact of grazing on the native grasses and the substitution of crested wheatgrass for native grasses, a subtle but more profound and lasting effect of grazing was a change in the fire ecology of Great Basin rangelands. During the initial overstocking of the rangelands, grasses were grazed to the extent that there was insufficient fuel to carry lightning-ignited fires. In many instances the shrubs were too widely spaced for fires to burn large acreages. This reduction in natural fires allowed shrub species to increase in stature and density by eliminating the low to moderate intensity fires that formerly kept the rangeland open in more of a grass dominated or grass-shrub mixture. In the absence of these low to moderate fires, shrub dominance became common. By the 1940s and 1950s, shrub dominance was such an issue that large acreages of sagebrush were subject to aerial spraying of herbicides to promote grass growth. Conversion of sagebrush to crested wheatgrass through use of the rangeland plow and seeding with rangeland drills was common in the 1960s, 1970s, and 1980s (Rich 1999, Miller and Eddleman 2000). These vegetation treatments added to the discontinuity in fuels and added to the reduction in fires.

By the 1960s the shrub density was sufficient that the fine fuels (grasses) were no longer needed to carry fires in much of the Great Basin rangelands and large, shrub-fueled fires began to occur. Due to the intensity of these fires, most of the perennial species were destroyed and cheatgrass, which was introduced in the late 1800s or early 1900s, began to expand and dominate many of the low elevation, low precipitation zone areas. This annual species has increased the frequency of fires where it exists, which prevents shrubs from re-establishing. Therefore, livestock grazing, in combination with introduced species and vegetation treatments have resulted in an altered fire regime. Increased fire return intervals through the 1900s from grazing levels that removed the fine fuels, allowed shrubs to dominate the landscape and cheatgrass to invade native range. Once the shrubs reached a critical fuel threshold, large, high intensity fires began to occur that resulted in many areas converting to annual grasslands. Initially the shrub build up provided habitat for sage grouse, but as the understory grasses and forbs declined and shrubs dominated, the critical nesting, pre-laying, and early brood habitats declined in abundance. The fires that followed eliminated many acres of sage grouse habitat, as well as habitat for the prey species on which the raptors depend.

As indicated in the Allotment Evaluation (BLM 2000c) there have been at least 23 wildland fires documented on the Owyhee Allotment during the period 1980 to 1996. Most of the fires were small in size (i.e., less than 50 acres), but several fires were greater than 375 acres, with an average of 1,720 acres in size.

Where sagebrush was increasing in density and cover, the competition between shrubs and grasses created additional stress on the grass plants. The ability of shrubs to acquire soil moisture and nutrients is greater than the ability of grasses. Where grazing adds to the stress on grasses by depleting root reserves, the decline in

grass abundance is accelerated. Periodic treatment of the vegetation, combined with seeding native perennial grasses when necessary, would offset the change in fire ecology that has eliminated the low to moderate intensity fires that kept the sagebrush community productive. This has had an overall impact on the productivity of many range sites, which has likely resulted in less prey species through loss of herbaceous forage and seed abundance. Similarly, this loss of various age classes and structure of the sagebrush community has resulted in less pre-laying, nesting, and early brood habitat for sage grouse.

The build up of the wild horse population within the HMA has also contributed to the current condition of the springs and upland vegetation.

3.4.5.2 Present Actions

Because of the remote location, current land uses on the allotment are primarily livestock grazing, dispersed recreation, and wildlife habitat. Water developments (guzzlers) for wildlife have been installed in the past ten years to provide stable water sources for pronghorn antelope, mule deer, and a variety of other wildlife species.

3.4.5.3 Reasonably Foreseeable Future Actions

The continuation of grazing under Alternatives 2, 3, or 4 would be anticipated to improve the general condition of the range. Alternative 3 would not provide for improvement of one spring and riparian vegetation. Non-native, invasive species would be anticipated to continue to be present in the allotments, but the rate of increase is likely to be less under Alternatives 2 and 4.

Overall improvement of the habitat for sage grouse and raptor prey species is anticipated under Alternatives 2 and 4, and improvement of only the uplands is anticipated under Alternative 3.

Fire suppression and burned area emergency rehabilitation are likely to continue. This is likely to reduce the changes in the plant community due to large fires (i.e., fire suppression should limit the size of the fires), but also result in somewhat less diverse communities in the short-term (i.e., the fire rehabilitation seed mixes generally only include a few species).

Increased human use would result if the BLM boat launching site is developed and has the potential to increase non-native, invasive species on the allotment, especially in the riparian area associated with the South Fork Owyhee River.

3.5 Irreversible/Irretrievable Commitment of Resources

None of the actions proposed for the alternatives analyzed in this EIS represent an irreversible or irretrievable commitment of resources. Each of the grazing management systems could be changed at a future date if the system is demonstrated as not achieving significant progress toward rangeland health standards. Similarly, the proposed range improvements could be removed, with the exception of the seedings (vegetation treatments), which generally represent a long-term change in the vegetation. However, the native vegetation could be restored, at considerable cost, if necessary.

3.6 Relationship Between the Local Short-Term Use of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term is defined as the period of time between the current allotment evaluations (2000) and the next evaluation, a period of 10 to 20 years. Long-term is defined as beyond the short-term period (i.e., greater than 20 years).

The short-term use of these allotments under Alternatives 2, 3, and 4 would have the overall impact of eliminating or reducing the effects of

grazing on the plant communities within the allotments. Consequently, the short-term use of the human environment would enhance the long-term productivity of the public lands. The allotment evaluation process and allotment monitoring are means of assessing the short-term use of the allotments with respect to long-term rangeland health standards and short- and long-term allotment-specific objectives.

Improvement of the rangeland health would have an overall positive benefit to the avian sensitivespecies which were the subject of this EIS. While some residual impacts to these species from the proposed management remain, the iterative nature of the allotment evaluation process allows for evaluation of the progress being made toward the rangeland health and allotment-specific objectives, and to address some of the residual impacts in the next evaluation cycle.

4.0 CONSULTATION AND COORDINATION

4.1 Public Scoping

Public involvement is an important and necessary component of the NEPA process. Documentation of this involvement has been compiled into a Project Scoping Document that includes a summary of the issues and concerns identified during the scoping process. The Project Scoping Document has been used by BLM to identify the key issues that would be analyzed in the EIS and to identify concerns that are not considered critical in terms of anticipated effects of the MUDs. The Project Scoping Document is on file and available for review during normal business hours at the BLM Elko Field Office (EFO).

A Notice of Intent (NOI) to prepare the EIS was published in the Federal Register on December 17, 2004. This NOI initiated the formal public scoping period and invited the public to provide scoping input for the EIS during a 30-day scoping period. The public scoping period ended on January 18, 2005.

On January 12, 2005 a public meeting was held in an open house format at the BLM field office in Elko, Nevada located at 3900 East Idaho Street Elko, Nevada. Representatives from the BLM and Nevada Department of Wildlife (NDOW) were present to give an overview of the project and give information in addition to the displays and presentation. Interpretive booths were set up in order to provide information for the public and to allow the public to query the agency representatives on the various topics and issues that may be addressed in the EIS. The meeting was attended by 17 people. Scoping comment forms and requests to be placed on the mailing list were available. Only four comment sheets and requests to be placed on the mailing list were received by the BLM.

BLM received comments from the public meeting, as well as written comments received via mail and e-mail. Individual comments as they pertained to defining the scope of the EIS, were numbered within each letter. The specific comments within each submission were identified and screened to distinguish “issues” from other types of input (i.e., data sources, concerns, opinion, etc.) using an agency-approved protocol. Comments received during the allotment evaluation process were also included as scoping comments. BLM also received comments following the close of the public scoping period. Those received after the close of the formal scoping period were still considered to the extent they raised issues germane to complying with the Minute Order.

In making his ruling and issuing the Minute Order, the Honorable Judge McKibben indicated that the NEPA analysis completed for the MUDs was adequate for all resources except for the sensitive bird species identified in the Minute Order. Many of the 148 comments/issues received from the public were determined to be beyond the scope of this EIS. Based on this ruling and the Minute Order, the issues that have been carried forward for analysis are identified in Section 1.5 and **Table 1-1**. The DEIS addresses the effects of grazing action from the MUDs, and alternatives, including proposed range improvements, to determine potential impacts on sage-grouse and the other sensitive raptors. The remaining issues are beyond the scope of the Minute Order and were not considered in the EIS.

4.2 Coordination with Other Federal, State, and Local Agencies

During the course of the allotment evaluations, BLM coordinated with U.S. Fish and Wildlife Service with respect to species listed under the Endangered Species Act. NDOW was a cooperating agency and also provided information on the sensitive species.

4.3 Native American Consultation

As a federal agency with jurisdiction over the management of public lands in northeastern Nevada, the BLM is required to provide affected tribes an opportunity to comment and consult on proposed actions that may have impacts to tribal resources, activities, or interests. Federally recognized Tribes with interests in management of the Elko district are:

Te-Moak Tribe of Western Shoshone

(Elko, South Fork, Wells, and Battle Mountain Bands)

Duck Valley Sho-Pai Tribes of Idaho and Nevada

Duckwater Shoshone Tribe

Ely Shoshone Tribe

Fort Hall Shoshone-Bannock Tribes of Idaho

Ibapah Goshute of Utah and Nevada

Skull Valley Gosuite of Utah

Yomba Shoshone

Historically, tribes have participated in planning site-specific projects; but not in the allotment evaluation and multiple use decision process. As a result, BLM's analysis of Native American Concerns, as presented in section 3.1.2.2 of this EIS, are based on existing analyses from the environmental assessments for the Big Springs and Owyhee MUDs, and information currently available to BLM's Native American Coordinator.

The Draft EIS, will be provided to the various Tribal leaderships (Chair people and Councils) and their staffs, tribal groups, and individuals with interests within the Elko BLM Field Office's administrative boundary (see list of tribes noted above). To encourage participation, BLM will also invite Tribal members to the public open house to present the Draft EIS for discussion with tribal members. Depending on the results of tribal review, BLM's analysis for Native American Concerns may be altered or expanded upon in the Final EIS.

4.4 Public Review of the Draft EIS

The BLM published a Notice of Availability of the Draft Environmental Impact Statement (DEIS) on December 2, 2005.

The DEIS was distributed on December 2, 2005 to individuals, organizations, and agencies on the Elko Field Office mailing list for the subject allotments (see next section for the distribution list). The document was also posted electronically on the BLM website.

4.5 Distribution List – Draft Environmental Impact Statement Review

The Draft EIS was distributed to various governmental agencies, organizations, and individuals. A list of the agencies, organizations, and individuals who were sent copies of the Draft EIS on December 2, 2005 is presented below.

Federal Agencies
Air Force Regional Environmental Office
U.S. Fish & Wildlife Service
BLM Ely Field Office
U.S. Forest Service
Environmental Protection Agency
Nevada BLM State Office

State Agencies
Nevada Department of Wildlife
Nevada State Clearinghouse Department of Admin.
Nevada Division of Agriculture

Elected Officials
Elko Board of County Commissioners
The Honorable Representative Jim Gibbons
The Honorable Senator Harry Reid
The Honorable Senator John Ensign

Tribal Organizations
Elko Band Council, Hugh Stevens – Chair
Duck Valley Sho-Pai Tribe, Terry Gibson - Chair
Wells Band Council, Kristi Begay - Chair
Temoak Tribal Council, Hugh Stevens - Chair
Battle Mountain Band Council, Joseph Holley - Chair
South Fork Band Council, Ronnie Woods - Chair
Duckwater Shoshone Tribe, Jerry Millet – Chair
Yomba Shoshone Tribe, Lisa Cagle – Chair
Western Shoshone Committee, Reggie Premo
Ely Shoshone Tribe, Dianna Buckner – Chair
Confederated Tribes of the Goshute, Amos Murphy – Chair

Organizations

Commission for the Preservation of Wild Horses
Colorado Wild Horse & Burro Coalition
Friends of Nevada Wildlife Attn: Tom Myers
Friends of Nevada Wilderness
Hawkwatch International, Inc
Nevada Outdoor Recreation Association
Committee for the High Desert and Western Watersheds Project
Sierra Club - Toiyabe Chapter Attn: Marjorie Sill
Sierra Club - Toiyabe Chapter Attn: Rose Strickland
The Wilderness Society Attn: Sara Barth
Wild Horse Organized Assistance
Natural Resources Defense Council
Red Rock Audubon Society
Nevada Cattleman's Association
Nevada High Country Tours
Red Rock Audubon Society
Nevada High Country Tours
National Mustang Assn. Inc.
Fund for Animals
Pine Valley Sheep Ranch, Inc
First National Bank in Evanston
Wilderness Impact Research Foundation

Businesses

Bank of Utah
H & R Livestock
Holland & Hart, LLP
Landfinder Country Properties
Ellison Ranching Company
Resource Concepts, Inc.
HTT Resource Advisors
Doby George LLC
Nevada Land & Resource Company
Vidler Water Company
Parasol Ranching LLC Big Springs Ranch
Newmont Gold Corporation
Independence Valley Ranch LLC
Big Springs Ranch LLC, The Star Living Trust
Darrel Kippens and Sons
Chournos, Inc
Thousand Peaks Ranches, Inc.

Individuals

Roger Scholl
Robert McGinty
Varlin Higbee
Charles and John Young
Martha P. Hoots
Scott Egbert
Sherie R. Goring
Jeffrey O. Roche
David D. Morris

This page left intentionally blank.

5.0 LIST OF PREPARERS

5.1 BLM EIS Team

Bryan Fuell	Project Co-Lead, Wild Horses
Lorrie West	Project Co-Lead, Environmental Coordination
Bruce Thompson	Rangeland Management
Kathy McKinstry	Rangeland Management
Jeff Moore	Rangeland Management
Karl Scheetz	Range Team Program Lead
Gerald Dixon	Native American Coordination
Ken Wilkinson	Wildlife Management
Wendy Fuell	Wildlife Management
Mark Coca	Non-Native, Invasive Species
Bryan Hockett	Cultural Resources
Carol Marchio	Soil, Water, and Air
Steve Dondero	Wilderness and Recreation
Shane DeForest	Manager, Renewable Resources
Bruce Piper	GIS
Kristine Dedolph	GIS

5.2 COOPERATING AGENCY - NDOW

Pete Bradley	Wildlife Biologist
Steve Foree	Supervisory Habitat Biologist

5.3 SRK EIS Team

Val Sawyer	Project Principal
Gary Back	Project Manager, Wildlife Ecology
Mark Willow	Assistant Project Manager, Wildlife Biology
Matt Banta	Range/Hydrology
Jon King	Sensitive Species (EDAW, Inc.)
Anne King	Sensitive Species (EDAW, Inc.)
Cari Anderson	Drafting

This page left intentionally blank.

6.0 REFERENCES

American Ornithologists' Union, Committee on Classification and Nomenclature. 1983. Check-list of North American Birds. Sixth Edition. American Ornithologists' Union, Allen Press, Inc., Lawrence, KS.

Aqua Engineering. 2000. Drinking Water Source Protection Plan for the City of West Wendover.

Autenrieth, R.E. 1981. Sage grouse management in Idaho. Idaho Department of Fish and Game Wildlife Bulletin 9.

Baglien, J. W. 1975. Biology and habitat requirements of the nesting Golden Eagle in southwestern Montana. Master's thesis, Montana State Univ., Bozeman.

Barrington, M.R., and G.N. Back. 1984. Sage grouse research: population dynamics. P. 43-46. *In*: P.C. Lent and R.E. Eckert, Jr. (eds.). Progress report for 1983, Saval Ranch Research and Evaluation Project. Univ. Nevada Reno, Renewable Resource Center, Reno, NV.

Batterson, W.M., and W.B. Morse. 1948. Oregon Sage Grouse. Oregon Game Comm., Portland. Oregon Fauna Serv. 1.

Bechard, M.J., R.L. Knight, D.G. Smith, and R.E. Fitzner. 1990. Nest sites and habitats of sympatric hawks (BUTEO spp.) in Washington. Journal of Field Ornithology 61:159-170.

Bechard, M. J., and J. K. Schmutz. 1995. Ferruginous Hawk (*Buteo regalis*). *In* The Birds of North America, No. 172 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

Beck, T.D.I. 1977. Sage Grouse flock characteristics and habitat selection in winter J. Wildl. Manage. 41:18-26.

Beier, P. and J. E. Drennan. 1997. Forest structure and prey abundance in foraging areas of northern goshawks. Ecol. Applications 7: 564–571.

Bilbrough, C.J. and J.H. Richards. 1993. Growth of sagebrush and bitterbrush following simulated winter browsing: mechanisms of tolerance. Ecology 74:481-492.

Biosystems Analysis, Inc. 1989. Endangered Species Alert Program Manual: Species Accounts and Procedures. Southern California Edison Environmental Affairs Division.

Braun, C.E. Britt, and R.O. Wallestad. 1977. Guidelines for maintenance of Sage Grouse habitats. Wildl. Soc. Bull. 5:99-106.

Briske, D.D. and J.H. Richards. 1995. Plant Responses to Defoliation: A Physiological, Morphological and Demographic Evaluation. *In*: D.J. Bedunah and R.E. Sosebee (eds.) Wildland Plants: Physiological Ecology and Developmental Morphology. Soc. Range Management. Denver, CO

Bureau of Land Management (BLM). 1986. Proposed Resource Management Plan and Final Environmental Impact Statement, Elko Resource Area. Elko, Nevada.

____. 1987. Elko Resource Management Plan Record of Decision. Elko, Nevada.

____. 1983. Proposed Wells Resource Management Plan and Final Environmental Impact Statement. Elko, Nevada.

____. 1985. Wells Resource Management Plan Record of Decision. Elko, Nevada.

____. 1985. Programmatic Environmental Assessment of Integrated Weed Management on Bureau of Land Management Lands.

_____. 1988. National Environmental Policy Act Handbook – BLM Handbook H-1790-1. Washington, D.C.

_____. 1991. Final Environmental Impact Statement – Vegetation Treatment on BLM Lands in Thirteen Western States.

_____. 1995. Interim Management Policy and Guidelines for Lands Under Wilderness Review. Washington, D.C. H-8550-1, Rel. 8-67.

_____.2000a. Sheep Allotment Complex Evaluation. Elko, Nevada.

_____. 2000b. Big Springs Allotment Evaluation. Elko, Nevada.

_____. 2000c. Owyhee Allotment Evaluation. Elko, Nevada.

_____. 2001a. Final Multiple Use Decision for the Sheep Allotment Complex. Elko, Nevada.

_____. 2002a. Final Multiple Use Decision for the Big Springs Allotment. Elko, Nevada.

_____. 2002b. Final Multiple Use Decision for the Owyhee Allotment. Elko, Nevada.

Cade, T. J. 1982. The falcons of the world. Cornell University Press, Ithaca, NY.

Connelly, J.W., and O.D. Markham. 1983. Movements and radionuclide concentrations of Sage Grouse in southeastern Idaho. J. Wildl. Manage. 47:169-177.

Connelly, J.W., H.W. Browers, and R.J. Gates. 1988. Seasonal movements of Sage Grouse in southeastern Idaho. J. Wildl. Manage. 55:521-524.

Connelly, J.W., W.L. Wakkinen, A.D. Apa, and K.P. Reese. 1991. Sage grouse use of nest sites in southeastern Idaho. J. Wildl. Manage. 55: 521-524.

Connelly, J.W., K.P. Reese, W.L. Wakkinen, M.D. Robertson, and R.A. Fischer. 1994. Sage Grouse ecology. Study I: Sage Grouse response to a controlled burn. Idaho Dep. Fish and Game, Boise. P-R Proj. W-160-R-21.

Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. Wildlife Society Bulletin 28:967-985.

Dietz, H.E. 1989. Grass: The stockman's crop. Sunshine Unlimited, Inc. Lindsborg, KS.

Eng, R.L., and P. Schladweiler. 1972. Sage Grouse winter movements and habitat use in central Montana. J. Wildl. Manage. 36:141-146.

Erlich, P. R., D. S. Dobkin and D. Wheye. 1988. The birder's handbook. Simon & Schuster, Inc., New York, NY.

Evans, D. L. 1982. Status reports on twelve raptors. U.S. Department of the Interior, Fish and Wildlife Service, Special Scientific Report No. 238.

Fischer, R.A. 1994. The effects of prescribed fire on the ecology of sage grouse in southeastern Idaho. Ph.D. Dissertation, University of Idaho, Moscow, ID.

Fischer, R.A., K.P. Reese, and J.W. Connelly. 1996. Influence of vegetal moisture content and nest fate on timing of female Sage Grouse migration. Condor 98:868-872.

Gill, R.B. 1965. Distribution and abundance of a population of Sage Grouse in North Park, Colorado. M.S. Thesis, Colorado State Univ., Fort Collins.

Gilmer, D. S., and R. E. Stewart. 1984. Swainson's hawk nesting ecology in North Dakota. Condor 86:12-18.

Green, G. A. and R. G. Anthony. 1989. Nesting success and habitat relationships of burrowing owls in the Columbia Basin, Oregon. Condor 91:347-354.

Gregg, M.A. 1991. Habitat use and selection of nesting habitat by sage grouse in Oregon.

M.S. Thesis, Oregon State Univ., Corvalis. 46pp.

Gregg, M.A., J.A. Crawford, M.S. Drut, and A.K. DeLong. 1994. Vegetational cover and predation of sage grouse nests in Oregon. J. Wildl. Manage. 58:162-166.

Gruell, G.E., L.E. Eddleman and R. Jandl. 1994. Fire history of the pinyon-juniper woodlands of Great Basin National Park. USDI, National Park Ser. Tech. Rep. NPS/PNROSU/NRTR-94/01.

Harrison, R.D., N.J, Chatterton, B.L. Waldron, B.W. Davenport, A.J. Palazzo, W.H. Horton, and K.H. Asay. Forage Kochia Its Compatibility and Potential Aggressiveness on Intermountain Rangelands. Res. Rpt. 162. Utah Agri. Exp. Stat., Utah State University. Logan, UT.

Holt, D. W. and S. M. Leasure. 1993. Short-eared Owl (*Asio flammeus*). *In* The Birds of North America, No. 62 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.

Houston, C.S. 1995. Thirty-two consecutive years of reproductive success at a Ferruginous Hawk nest. Journal of Raptor Research 29:282-283.

Howard, R.P., and M.L. Wolfe. 1976. Range improvement practices and Ferruginous Hawks. Journal of Range Management 29:33-37.

Hupp, J.W., and C.E. Braun. 1989. Topographic distribution of Sage Grouse foraging in winter. J. Wildl. Manage. 53:823-829.

Jewiss, O.R. 1972. Tillering in grasses – its significance and control. J. Br. Grassland Society. 27:65-82.

Klebenow, D.A. 1969. Sage grouse nesting and brood habitat in Idaho. J. Wildl. Manage. 33:649-661.

____. 1982. Livestock grazing interactions with sage grouse. Proc. Wildlife-Livestock Relationships Symp., Coeur d'Alene, Idaho. Univ. Idaho, Moscow. pp.113-123.

____. 1985. Habitat management for sage grouse in Nevada. World Pheasant Assoc. 10:36-46.

Klebenow, D.A., and G.M. Gray. 1968. Food habits of juvenile sage grouse. J. Range Manage. 21:80-83.

Kochert, M. N., K. Steenhof, C. L. McIntyre, and E. H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). *In* The Birds of North America, No. 684 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

Leary, A.W., R. Mazaika, and M.J. Bechard. 1998. Factors affecting the size of Ferruginous Hawk home ranges. Wilson Bulletin 110:198-205.

Marks, J. S., D. L. Evans, and D. W. Holt. 1994. Long-eared Owl (*Asio otus*). *In* The Birds of North America, No. 133 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.

Martin, N.S. 1970. Sagebrush control related to habitat and Sage Grouse occurrence. J. Wildl. Mange. 34:313-320.

Maser, C., J.W. Thomas, and R.G. Anderson. 1984. Wildlife habitats in managed rangelands—The Great Basin of southeastern Oregon. The relationship of terrestrial vertebrates to plant communities. USDA Forest Service Pacific Northwest Research Station and USDI Bureau of Land Management, General Technical Report PNW-172. La Grande, OR

McAdoo, J.K., G.N. Back, M.R. Barrington, and D.A. Klebenow. 1986. Wildlife use of lowland meadows in the Great Basin. Trans. N. Amer. Wildl. & Nat. Res. Conf. 51:310-319.

McCallum, D.A. 1994a. Review of technical knowledge: flammulated owls. Pages 14-46 *in* Flammulated, boreal and great grey owls in the United States: a technical conservation assessment. G. D. Hayward and J. Verner, editors. USDA For. Serv. Rocky Mtn. For. and Range Exp. Stn. Rocky Mtn. Gen. Tech. Rep. GTR-RM-253.

McCallum, D. A. 1994c. Flammulated Owl (*Otus flammeolus*). *In* The Birds of North America, No. 93 (A. Poole and F. Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union.

Miller, F.M. and L. L. Eddleman. 2000. Spatial and Temporal Changes of Sage Grouse Habitat in the Sagebrush Biome. Tech. Bulletin 151. Oregon State University, Corvallis.

Miller, R.F., and J.A. Rose. 1999. Fire history and western juniper encroachment in sagebrush steppe. J. Range Manage. 52: 550-559.

NatureServe. 2005. NatureServe Explorer: An online encyclopedia of life. Version 4.5. NatureServe, Arlington, Virginia.

http://www.natureserve.org/explorer

Neel, L. 1980. Sage grouse response to grazing management in Nevada. M.S. Thesis, Univ. Nevada-Reno.

Neel, L. A., ed. 1999. Bird Conservation Plan. Nevada Partners in Flight. Reno, NV.

http://www.blm.gov/wildlife/plan/pl-nv-10.pdf

Nevada Department of Wildlife (NDOW). 2004. Sage Grouse Conservation Plan for Nevada and Portions of Eastern California. Reno, Nevada.

____. 2005. Nevada Comprehensive Wildlife Conservation Strategy. Reno, NV.

Nevada Natural Heritage Program. 2005. Detailed rare animal list. http://heritage.nv.gov/animlsml.htm

Nevada Division of Wildlife. 2000. Nevada Sage Grouse Conservation Strategy. L. Neel (ed.). Reno, Nevada

Niemuth, N. 1992. Use of man-made structures by nesting Ferruginous Hawks in Wyoming. Prairie Naturalist 24:43.

Norton, B.E. and P.S. Johnson. 1983. Pattern of defoliation by cattle grazing crested wheatgrass pastures. p. 462-464. *In:* J.A. Smith and V.W. Hayes (eds.) Proc. XIV Int. Grassland Congress. Westview Press, Boulder, CO.

Oakleaf, R.J. 1971. Relationship of Sage Grouse to upland meadows in Nevada. M.S. thesis, Univ. of Nevada, Reno.

Palmer, R. S. 1988. Handbook of North American birds. Vol. 4. Diurnal raptors (part 1). Yale Univ. Press, New Haven, CT.

Patterson, R.L. 1952. The Sage Grouse in Wyoming. Sage Books, Inc., Denver, CO.

Perkins, M.A. and W.A. Lindsey. 1983. Nesting studies of ferruginous hawks in the Ely BLM District, Nevada. North American Bird Bander 8(3):106-108.

Reynolds, R. T., B. D. Linkhart. 1992. Flammulated Owls in ponderosa pine: Evidence of preference for old growth. Pp. 166–169 *in* Old-growth forests in the Southwest and Rocky Mountain regions: Proceedings of a workshop (M. R. Kaufmann, W. H. Moir, and R. L. Bassett, tech. coords.). U.S. For. Serv. Gen. Tech. Rep. RM–213.

Rich, T. 1999. Trends in Selected Livestock Management Actions on BLM Lands in Sage Grouse States. 14 June, 1999. Unpublished summary of BLM actions based on data available in: *Public Land Statistics*. 1997, Vol. 182.

Richards, J.H. and M.M. Caldwell. 1985. Soluble carbohydrates, concurrent photosynthesis and efficiency in regrowth following

defoliation: A field study with *Agropyron* species. J. Appl. Ecol. 22:907-920.

Robertson, M.D. 1991. Winter ecology of migratory Sage Grouse and associated effects of prescribed fire in southeastern Idaho. M.S. Thesis, Univ. Idaho, Moscow.

Savage, D.E. 1968. The relationship of Sage Grouse to upland meadows in Nevada. M.S. thesis, Univ. Of Nevada, Reno.

Schlatterer, E.F., and D.B. Pyrah. 1970. Ecological effects of chemical and mechanical sagebrush control. Montana Fish and Game Dept., Fed. Aid Wildl. Rest. Proj. W-105-R-4. Job Compl. Rept. 121 pp.

Schmalzried, J. T. 1976. Nesting and food habits of the Golden Eagle on the Laramie Plains. Master's thesis, Univ. of Wyoming, Laramie.

Schroeder, M.A., J.R. Young, and C.E. Braun. 1999. Sage Grouse (*Centrocercus urophasianus*). *In:* The Birds of North America No. 425, (A. Poole and F. Gill, eds.), The Birds of North America, Inc., Philadelphia, PA.

Schmutz, J.K. 1987. The effect of agriculture on Ferruginous and Swainson's hawks. Journal of Range Management 40:438-440.

Schmutz, J. K., and R. W. Fyfe. 1987. Migration and mortality of Alberta ferruginous hawks. Condor 89:169-174.

Scott, J.W. 1942. Mating behaviour of the Sage Grouse. Auk 59: 477-498.

Seibert, D. J., R. J. Oakleaf, J. M. Laughlin, J. L. Page. 1976. Nesting ecology of Golden Eagles in Elko County, Nevada, Tech. Note 281. U.S. Dep. Int., Bur. Land Manage., Denver, CO.

Sherrod, S. K. 1983. Behavior of fledgling peregrines. Pioneer Impressions, Fort Collins, CO (available from The Peregrine Fund, Inc., Ithaca, NY.)

Smith, D.G., and J.R. Murphy. 1978. Biology of the Ferruginous Hawk in central Utah. Sociobiology 3:79-98.

Squires, J. R., and R. T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*). *In* The Birds of North America, No. 298 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C.

Sveum, C.M., W.D. Edge, and J.A. Crawford. 1998a. Nesting habitat selection by Sage Grouse in south-central Washington. J. Range Manage. 51:265-269.

Sveum, C.M., J.A. Crawford, and W.D. Edge. 1998b. Use and selection of brood-rearing habitat by Sage Grouse in south central Washington. Great Basin Nat. 58: 344-351.

Terres, J. K. 1980. The Audubon Society encyclopedia of North American birds. Alfred A. Knopf, New York.

Wakeley, J.S. 1978. Factors affecting the use of hunting sites by Ferruginous Hawks. Condor: 80:316-326.

Wallestad, R.O. 1971. Summer movements and habitat use by Sage Grouse broods in central Montana. J. Wildl. Manage. 35:129-136.

____. 1975. Life history and habitat requirements of Sage Grouse in central Montana. Montana Dep. Fish, Game, and Parks, Helena.

Wallestad, R.O, J.G. Peterson, and R.L. Eng. 1975. Foods of adult Sage Grouse in central Montana. J. Wildl. Manage. 39:628-630.

Ward, J. P., L. R. Hanebury, R. L. Phillips. 1983. Raptor inventory of coal areas in western North Dakota. Rep. prepared for U.S. Fish Wildl. Serv., Bismarck Field Office, Bismarck, ND.

Widén, P. 1989. The hunting habitats of goshawks *Accipiter gentilis* in boreal forests of central Sweden. Ibis 131: 205-231.

Wijnandts, H. 1984. Ecological energetics of the Long-eared Owl (*Asio otus*). Ardea 72: 1–92.

Wiley, R.H., Jr. 1978. The lek mating system of the Sage Grouse. Sci. Am. 238(5): 114-125.

Whisenant, S.G. 1990. Changing fire frequencies on Idaho's Snake River Plains: ecological management implications. Pages 4-10 *in* E.D. McArthur, E.M. Romney, and P.T. Tueller, editors, Proceedings of the symposium on cheatgrass invasion, shrub die-off, and other aspects of shrub biology and management, Las Vegas, NV, April 5-7, 1989. USDA Forest Service General Technical Report INT-276. Intermountain Research Station, Ogden, UT.

White, C. M., N. J. Clum, T. J. Cade and W. G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). *In* A. Poole and F. Gill, (eds.). The Birds of North America, No. 660. The Birds of North America, Inc., Philadelphia, PA.

Young, J.A., R.E. Eckert, Jr., and R.A. Evans. 1979. Historical Perspectives Regarding The Sagebrush Ecosystem. Univ. Nevada, Renewable Resources center, Reno, NV.

Young, J.A. and R.A. Evans. 1981. Demography and fire history of a western juniper stand. J. Range Manage. 34: 501-506.

Younk, J. V. and J. Bechard. 1994. Breeding ecology of the northern goshawk in high-elevation aspen forest of northern Nevada. Stud. Avian Biol. 16: 119-121.

7.0 GLOSSARY AND LIST OF ACRONYMS

7.1 Glossary

Areas of Critical Environmental Concern – areas identified as having special resource values, the integrity of which could be violated if managed under multiple-use concepts. These areas receive special management to protect the resource values. These areas may include areas with special wildlife habitats, cultural values, unique vegetation, etc.

Appropriate Management Level – the number of wild horses that can be sustained within a designated HMA which achieves and maintains a thriving natural ecological balance, keeping with the multiple-use management concept for the area. The AML for an HMA is based on in-depth analysis and monitoring data and established through a decision process.

Allotment Management Plan – A management plan for grazing a specific allotment, based on allotment-specific goals and objectives, consistent with the Land Use Plan and Standards for Rangeland Health. The plan includes consideration of wildlife, wild horses, and other resources, as appropriate.

Animal Unit Month – the amount of forage necessary for the sustenance of on cow or its equivalent (i.e., five sheep) for a period of one month.

Carrying Capacity – an estimate of the number of AUMs available within a pasture or allotment.

Herd Area and Herd Management Area – a Herd Areas are limited to areas of public lands identified as being habitat used by wild horses at the time of the passage of the Wild Free-Roaming Horse and Burro Act of 1971, as amended. Herd Management Areas area subsets of the Herd Areas and are designated only on areas of public lands within Herd Areas where long-term management of wild horses can be sustained.

Land Use Plan – an overriding management plan for an area (generally a BLM District or portion thereof) that has been developed through public input and involvement. The land use plan provides management direction for the various resources and programs which the BLM oversees. Management actions carried out by the BLM must be in conformance with the Land Use Plan, or the Land Use Plan may be amended, through a public process, to accommodate the proposed action.

Multiple Use Decisions – is a decision to implement a management plan to meet the multiple use objectives for an allotment(s), consistent with the applicable Land Use Plan and plan amendments, Standards and Guidelines for Rangeland Health, and other applicable management direction. The Multiple Use Decision is based on an evaluation of monitoring data specific to the allotment to which the decision applies and involves public input with respect to the management options.

7.2 List of Acronyms

ACEC	Area of Critical Environmental Concern
AML	Appropriate Management Level
AMP	Allotment Management Plan
AUM	Animal Unit Month
BLM	Bureau of Land Management
BSR	Big Springs Ranch
CC	Carrying Capacity
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
EFO	Elko Field Office
EIS	Environmental Impact Statement
FFR	Fenced Federal Range
FLPMA	Federal Land Policy and Management Act
FRH	Fundamentals of Rangeland Health
HMA	Herd Management Area
HSU	Historic Suspended Use
LUP	Land Use Plan
MBTA	Migratory Bird Treaty Act
MUD	Multiple Use Decisions
NDOT	Nevada Department of Transportation
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NRS	Nevada Revised Statutes
OHV	Off Highway Vehicle
PCS	Potential Contamination Sources
RAC	Resource Advisory Council
RMP	Resource Management Plans
ROD	Record of Decision
RPS	Rangeland Program Summary
SOP	Standard Operating Procedure
State Team	State Sage-Grouse Conservation Team
USFWS	U.S. Fish and Wildlife Service
VNU	Voluntary Non-Use
WAFWA	Western Association of Fish and Wildlife Agencies
WSA	Wilderness Study Area

8.0 INDEX

APPENDIX A
MAPS

APPENDIX B
REGULATORY FRAMEWORK

Regulatory Framework - Vegetation

Public lands under BLM administration are managed for multiple use under the guidance of the Elko and Wells RMPs. In addition, the Northeastern Great Basin RAC developed *Standards and Guidelines for Rangeland Health* for the area, and these standards are guidelines to provide direction for BLM management. The individual AMPs also include allotment-specific objectives for management of the allotments.

The Carson-Foley Act of 1968 directs the BLM to take any action necessary "to prevent unnecessary and/or undue degradation of the public lands." The Noxious Weed Act of 1974, as amended by Section 15 of the Management of Undesirable Plants on Federal Lands (1990), authorizes the Secretary of Interior to "cooperate with other federal and state agencies and others in carrying out operations or measures to eradicate, suppress, control, prevent, or retard the spread of any noxious weed." The provisions of the act direct the agencies to consider noxious weeds when considering impacts of surface disturbing activities. Executive Order 13112: Invasive Species (1999) requires each federal agency whose actions may affect the status of invasive species to identify such actions and implement measures to prevent the introduction of invasive species as well as detect and respond rapidly to control populations of invasive species. U.S. Department of Interior Manual 609 sets forth policy to control undesirable or noxious weeds on the lands, waters, or facilities under its jurisdiction, to the extent economically practicable, and as needed for resource protections and accomplishment of resource management objectives.

Regulatory Framework – Wetlands/Riparian Zones

Public lands under BLM administration are managed for multiple use under the guidance of the Elko and Wells RMPs. In addition, the Northeastern Great Basin RAC developed *Standards and Guidelines for Rangeland Health* for wetland and riparian areas, and these standards are guidelines to provide direction for BLM management. The individual AMPs also include allotment-specific objectives for wetland/riparian area management.

Executive Order 11990: Protection of Wetlands is an overall wetlands policy for all agencies managing federal lands, sponsoring federal projects, or providing federal funding to state or local projects. Under this order, federal agencies are to use measures of avoidance, mitigation, or preservation with public input before proposing new construction in wetlands. The BLM Riparian-Wetland Initiative for the 1990s provides a national strategy for management and restoration of riparian/wetland areas on BLM-administered lands.

Regulatory Framework – Avian Sensitive Species

The sensitive species designation is normally used for species that occur on BLM-administered lands for which BLM has the capability to significantly affect the conservation status of the species through management. BLM Sensitive Species are those species: 1) that are currently under status review by the U.S. Fish and Wildlife Service, 2) whose numbers are declining so rapidly that Federal listing may become necessary; 3) with typically small and widely dispersed populations; 4) that inhabit ecological refugia or other specialized or unique habitats; or 5) are included as State of Nevada Listed Species (under the authority of Nevada Administrative Codes 501.100 - 503.104), but which may be better conserved through application of BLM sensitive species status. Nevada BLM policy is to provide State of Nevada Listed Species and Nevada BLM Sensitive Species with the same level of protection as is provided for Federally listed candidate species and their habitats to ensure that actions authorized, funded, or carried out by the BLM do not contribute to the need for the species to become listed as threatened or endangered under the Endangered Species Act.

The Bald Eagle Protection Act (PL 92-535), through provisions and amendments, provides federal protection to the golden eagle. This act prohibits the direct or indirect taking of an eagle, eagle part or product, or eagle nest.

The Migratory Bird Treaty Act of 1918, as amended, prohibits the taking of any migratory birds without a permit. An action that contributes to unnatural migratory bird mortality could be considered a violation of this act. Many of the raptor species are migratory species, and therefore, are afforded protection under this act.

The State of Nevada has developed the *Nevada and Eastern California Sage-Grouse Conservation Plan* (NDOW 2004) to guide the conservation of sage grouse in Nevada. In addition, WAFWA has developed range wide guidelines to manage sage grouse populations and their habitats (Connelly et al. 2000). BLM Nevada has also developed specific guidelines that were finalized October 2000 to direct management activities in the State in relation to sage grouse habitat requirements.

Nevada Revised Statutes (NRS 501.181) authorizes NDOW and the Wildlife Commission with the protection, propagation, restoration, transplanting, introduction, and management of wildlife in the state.

Regulatory Framework – Non-Native, Invasive Species

Public lands under BLM administration are managed for multiple use under the guidance of the Wells RMP. In addition, the Northeastern Great Basin RAC developed *Standards and Guidelines for Rangeland Health* for the area, and these standards are guidelines to provide direction for BLM management. The individual AMP also includes allotment-specific objectives for management of the allotments.

The Carson-Foley Act of 1968 directs the BLM to take any action necessary "to prevent unnecessary and/or undue degradation of the public lands." The Noxious Weed Act of 1974, as amended by Section 15 of the Management of Undesirable Plants on Federal Lands (1990), authorizes the Secretary of Interior to "cooperate with other federal and state agencies and others in carrying out operations or measures to eradicate, suppress, control, prevent, or retard the spread of any noxious weed." The provisions of the act direct the agencies to consider noxious weeds when considering impacts of surface disturbing activities. Executive Order 13112: Invasive Species (1999) requires each federal agency whose actions may affect the status of invasive species to identify such actions and implement measures to prevent the introduction of invasive species as well as detect and respond rapidly to control populations of invasive species. U.S. Department of Interior Manual 609 sets forth policy to control undesirable or noxious weeds on the lands, waters, or facilities under its jurisdiction, to the extent economically practicable, and as needed for resource protections and accomplishment of resource management objectives.

Regulatory Framework - Native American Issues and Concerns

In accordance with the National Historic Preservation Act (P.L. 89-665), the National Environmental Policy Act (P.L. 91-190), the Federal Land Policy and Management Act (P.L. 94-579), the American Indian Religious Freedom Act (P.L. 95-341), the Native American Graves Protection and Repatriation Act (P.L. 101-601) and Executive Order 13007, the BLM must provide affected tribes an opportunity to comment and consult on proposed actions that may have impacts to tribal resources, activities, or interests. BLM must attempt to limit, reduce, or possibly eliminate any negative impacts to identified Native American traditional/cultural/spiritual sites, activities, and resources.

Also, in accordance with Federal legislation and executive orders, Federal agencies must consider the impacts their actions may have to Native American traditions and religious practices. Consequently, the BLM must take steps to identify locations having traditional/cultural or religious values to Native Americans and insure

that its actions do not unduly or unnecessarily burden the pursuit of traditional religion or traditional lifeways.